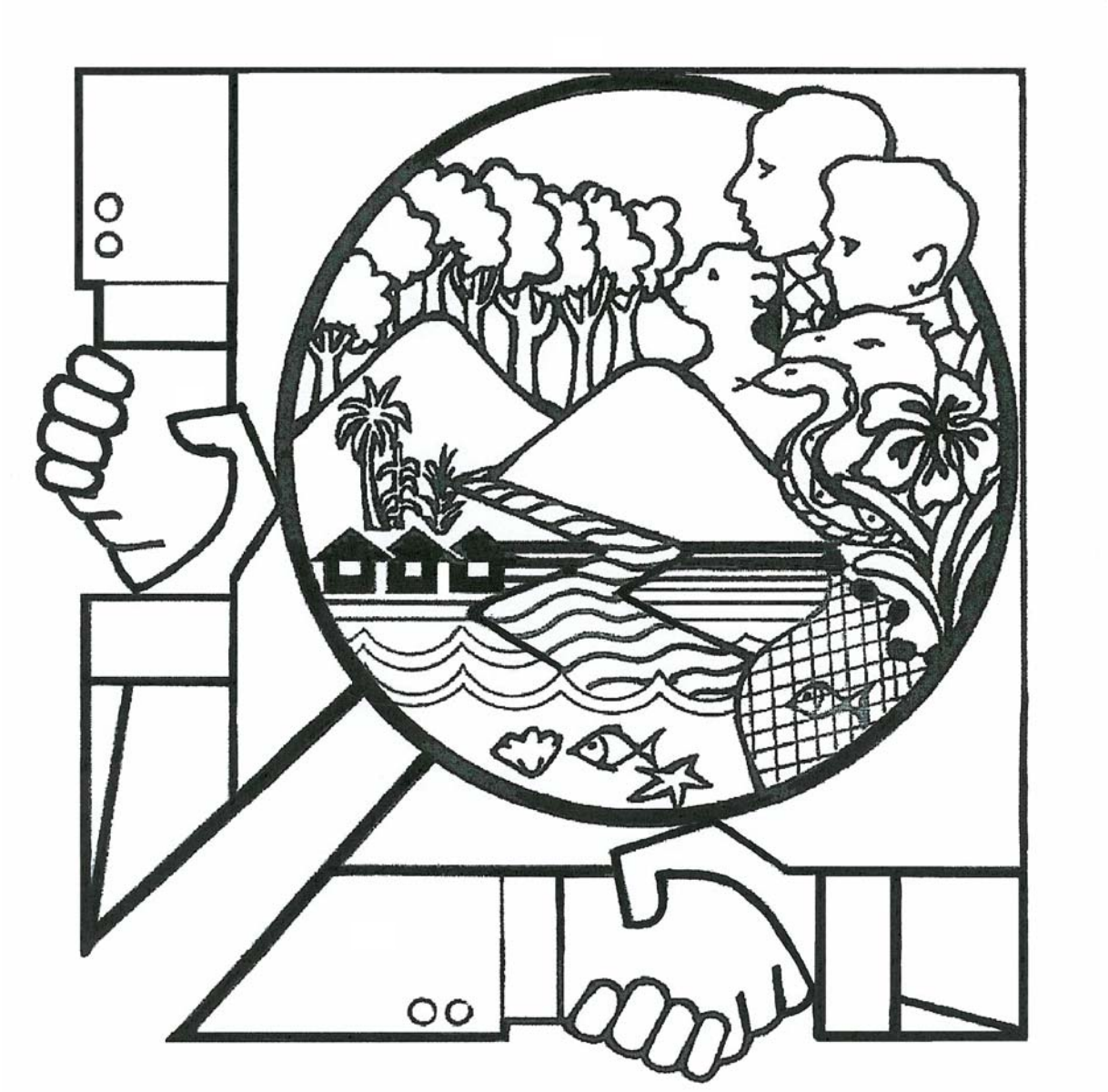
Development of a Participatory Methodology for Inventory and Assessment of Floral Resources and their Characterization in the Montane Forests of Mt. Malindang



Jose B. Arances
Colin Ridsdale
Lilibeth V. Rufila
Rufino Comilap
Noli Pacut

Victor B. Amoroso
Leontine Visser
Jennifer B. Galvezo
Carlos Lumaray
Benigno Montimar

William Sm. Gruezo
Benito C. Tan
Guiller S. Opiso
Carmilo Comilap
Sulficio Sacal

Biodiversity Research Programme (BRP) for Development in Mindanao:
Focus on Mt. Malindang and Environs

Development of a Participatory Methodology for Inventory and Assessment of Floral Resources and their Characterization in the Montane Forests of Mt. Malindang

Jose B. Arances, Victor B. Amoroso, William Sm. Gruezo, Colin Ridsdale,
Leontine Visser, Benito C. Tan, Lilibeth V. Rufila, Jennifer B. Galvezo,
Guiller S. Opiso, Rufino Comilap, Carlos Lumaray, Carmilo Comilap,
Noli Pacut, Benigno Montimar, Sulficio Sacal

under the

Biodiversity Research Programme (BRP) for Development in Mindanao:
Focus on Mt. Malindang and Environs

The Biodiversity Research Programme (BRP) for Development in Mindanao is a collaborative research programme on biodiversity management and conservation jointly undertaken by Filipino and Dutch researchers in Mt. Malindang and its environs, Misamis Occidental, Philippines. It is committed to undertake and promote participatory and interdisciplinary research that will promote sustainable use of biological resources, and effective decision-making on biodiversity conservation to improve livelihood and cultural opportunities.

BRP aims to make biodiversity research more responsive to real-life problems and development needs of the local communities, by introducing a new mode of knowledge generation for biodiversity management and conservation, and to strengthen capacity for biodiversity research and decision-making by empowering the local research partners and other local stakeholders.

Printed by PDM Press, Inc., Quezon City, Philippines

ISBN 971-560-105-7

Funding for BRP is provided by the Netherlands Ministry for Development Cooperation (DGIS) through the SEAMEO Regional Center for Graduate Study and Research in Agriculture (SEARCA).

Contents

Abstract

With the participation of Subanens as local researchers, an assessment of plant diversity in two 1-ha semipermanent plots located in Mt. Ginanlajan and Palo 6, Malindang Range was conducted. The assessment revealed 301 species, 181 genera, and 113 families. The scientific identification of plants was enriched by local indigenous knowledge. A complete inventory of trees showed high species richness (63-67 species/ha) and high tree density (961-1,000 trees/ha). These figures are higher than those reported for lowland and montane forests in Mt. Kitanglad and other neotropical countries. Assessing floral resources also revealed 2 endangered species, 71 endemic species, 11 rare and 171 economically important species, and 10 species that are socioculturally important based on the indigenous knowledge of local researchers, and 79 species as surveyed from the communities. Endemism is high with 48 (57%) of the 85 tree species endemic. Three new species of mosses not yet found in the Philippines were discovered. When the number of species between primary and secondary forests was compared, more species were found in the primary forest than in the secondary forest, but there were more individuals of similar species in the secondary forest than in the primary forest. Moreover, an ethnobotanical survey based on the indigenous knowledge of local researchers has shown many economically important plants, of which 39 species are medicinal, 14 species are food plants, 18 species are ornamentals, and 100 species are either used for lumber, firewood, and handicraft. An ethnobotanical survey of the communities revealed 247 medicinal plant species, 79 food plants and 134 species with economic importance. As a result of participatory inventory assessment and community validation, local researchers–Subanens–have identified the establishment of a nursery of fast-growing trees and a community economic garden as potential livelihood projects for biodiversity conservation. Using stepwise regression, the identification of tree species made by both trained and untrained local researchers from subquadrats (5 x 5 m) revealed no significant relation or contribution to the identification using scientific and common names. However, identification of scientific names by trained local researchers approached significant level (0.08, with 0.05 significant level). These researchers significantly contributed to the scientific identification of lower forms of plants, and identification of food plants and their other uses. Moreover, both trained and untrained local researchers contributed significantly to identifying medicinal uses of plants. Participation of local people in biodiversity assessment yielded a wealth of local nomenclature of floral species. The active participation of trained local researchers enriched scientific results on inventory and assessment of floral resources, particularly on ethnobotanical knowledge.

Introduction

The Mt. Malindang Natural Park is one of the remaining intact forests considered as the "hottest among the hotspots" in the Philippines. Located in the province of Misamis Occidental, Mindanao, it is the only representative natural forest in the Zamboanga Peninsula Biogeographic Zone (Myers 1988). The results of participatory rapid appraisal (PRA) manifested high species richness, many endemic and socioecoculturally important floral resources. But these data are only indicative in nature. The kind and realistic levels of biodiversity resources need to be inventoried and assessed so that strategies for their sustainable development can be effectively designed and implemented. Biodiversity conservation becomes more imperative as more pressure is made, through the constant use of biodiversity resources, causing the loss of habitat and reduction in species richness.

For floral assessment, it is envisioned that the project will be undertaken in three sites-the upper montane, lower montane, and lowland forests. The first year of the project focused on upper montane forest located at barangays Lake Duminagat and Mansawan in the municipality of Don Victoriano.

The interconnectedness among forest zones (upper montane, lower montane, and lowland), and landscape research will be realized in the second generation research with the skills, competence, experiences, and indigenous knowledge of the Subanens during the 1st generation research on the upper montane forest.

The participatory research on inventory and assessment of floral research in Mt. Malindang Forest have identified the following knowledge gaps during the PRA:

1. Extent of participation of local partners with researchers that enhance/enrich scientific results.

2. Lack of empirical information that local stakeholders' participation has enriched/ enhanced scientific results.

3. Lack of sufficient scientific and indigenous knowledge on species richness, diversity, and conservation status of floral resources in Mt. Malindang forests.

This project was conducted to understand these parameters to provide a guide for researchers, communities, and institutions on the project sites in designing protection and conservation strategies of floral resources. These are the bases of identifying livelihood opportunities for developing socioeconomic interventions and sustained floral biodiversity conservation measures in the forests of Mt. Malindang.

Review of Literature

Biodiversity Plots and Transects

Historically, vegetation research on forests was basically forestry-oriented rather than conservation/biodiversity-oriented and used large 1-ha plots. These were usually located in areas which had a previous history of forest botanical surveys and collections which enabled easy identification of the sterile samples (Dallmier and Comiskey 1996, Dallmier 1992, Castillo and Fernando 2000, and Madulid 2000). Recently, ecological research used plots of far smaller sizes varying from 0.01 ha to 0.3 ha. The location of these plots can be arbitrary in different vegetation types, randomly selected in a 1-ha area or at points along a transect line. The smaller size allows a replicate approach and reduces the large amount of work required in large 1-ha plots (Polacks 2000).

In the last 10 years, the Philippine National Museum has established five 1-ha permanent plots in selected areas, viz., in Palawan, Bicol National Park, Mt. Kitanglad National Park, Romblon, and Mindoro. These permanent plots were established primarily to assess the biodiversity for conserving species and forests. The data obtained were used to develop management plans of protected areas (Madulid 2000).

Typology of Participation

According to Espaldon (2000), the typology of participation in landscape appraisal (PLLA or PRA) consists of:

1. Participation wherein the stakeholders are only informed of the project and its findings and they have no stake in the processes (passive participation);

2. Participation in information giving where stakeholders are only asked to provide information needed by the project and they have no knowledge of the processes involved (passive participation);

3. Participation by consultation wherein the stakeholders are consulted only on the nature and progress of the project for affirmation and for forging an agreement (passive participation);

4. Participation for material incentives wherein the stakeholders are hired as workers or they are provided with some form of compensation without their taking part in decision making (passive participation);

5. Functional participation wherein the stakeholders are given supervisory functions as part of junior level functions of the project's organizational structure (less active participation);

6. Interactive participation wherein the stakeholders interact with the management at any stage of the project (active participation); and

7. Self mobilization participation wherein the stakeholders interact and empowered for self-mobilization even beyond the duration of the project to be able to develop competence for self-determination (ideal active participation).

Species Richness and Studies on Mindanao Flora

To date, there are some 12,000 species of plants credited to the Philippines, consisting of 8,000 flowering plants (Madulid 1995), 1,023 ferns (Amoroso 1997), 77 fern-allies, and 3,000 nonvascular plants (Zamora 1991).

Of the 12,000 plant species, 72 species are listed officially as endangered (Tan et al 1986, Gruezo 1990). Furthermore, Madulid (1991) reported that of the 8,000 species of flowering plants, about 3,500 species and 23 genera are endemic to the country.

Studies on biodiversity in Mindanao have been conducted by Pipoly and Madulid (1996), Amoroso C. et al (2000) and Amoroso V. (2000) on trees; Amoroso et al (1996), Amoroso and Mirasol (2000), Alava (2000), Alombro (2000), Gonzales (2000) on ecosystematic of pteridophytes, Rojo (1996) on dipterocarps, and Lubos (2000) on mosses in selected mountains of Mindanao.

Over the years, only a few biological expeditions have been undertaken to gather more information about the flora and fauna of Mt.

Malindang and its surroundings. In 1906, E.A. Mearns did a worthy expedition by collecting a good many faunal and botanical specimens but described only what he thought to be novelties (Mearns 1907 and 1909). In 1956, Rabor conducted an expedition and collected 92 bird species mostly from above 1,200 m (Rand and Rabor 1960). Mearns (1907) reported heavy forest growth in 1906, whereas, Rabor (1960) observed the disappearance of the forest cover on the lower slopes.

Biological Resources of Barangays Covered by the Project

Results of the participatory rural appraisal conducted from April to May 1999 showed the following biological resources:

Barangay Mansawan

The floral resources identified during the transect walk consisted of 244 species. The flora were dominated by grasses, herbs, and shrubs. There were very few trees and no more natural forests found within barangay Mansawan. The domesticated/cultivated plants were onions, cabbage, sweet potato (camote), lutia, gabi (taro) and sayote (chayote). The perennial plants were bananas, avocado, and nangka (jackfruit) trees.

Fauna were dominated by birds and arthropods consisting of about 39 species. Most of the birds were grass warblers and Philippine bulbuls considered insectivores. The arthropods consisted of arachnids, diplopods, and insects. The insects were dominated by beetles, followed by moths, butterflies, syrphid flies, wasps, and bees. Mansawan is classified as moderate in terms of biodiversity status.

Barangay Gandawan

The floral species identified along the transect consisted of 300 species. Most of these were trees which were dominantly Agathis and dipterocarps, considering the presence of natural forests in the high rising steep mountains around the barangay. Ornamental plants within the open grasslands were also diverse and rich in terms of species. The domesticated/cultivated plants were cabbage, onion, sweet potato, taro, chayote, and lutia. Some planted abaca for fiber as an additional source of income.

Faunal resources were dominated by birds and arthropods involving about 39 species. Among the birds, the grass warblers and Philippine bulbuls were predominant. The arthropods were composed of three classes–Arachnida, Diplopoda, and Insecta. Class Insecta was dominated by beetles, followed by moths, butterflies, syrphid flies, wasps, and bees.

Rand and Rabor (1960) reported that Gandawan was covered with virgin forests in 1956 except for some 10 ha of cultivated patches within a 200-ha area and several new clearings with only one family living in the area. In 1993, most of Gandawan was under cultivation or grassland, with only secondary forests present and 45 families living in the area.

Barangay Lake Duminagat

The floral resources along the transect consisted of 274 species. Most of these species were trees belonging to Syzygium and Podocarpus genera. Considering the presence of natural forests in the high-steep-rising mountains surrounding the barangay, ornamental species within the open grasslands and in natural forests were also abundant and diverse. The domesticated/ cultivated plants were similar to Barangay Gandawan, which included cabbage, onions, sweet potato, taro, chayote, and lutia grown for food and for cash.

The faunal resources were also dominated by birds and arthropods involving about 49 species. Among the birds, grass warblers and Philippine bulbuls were regarded as beneficial for being insectivores and eating harmful insects. Similar biodiversity was observed in Barangays Mansawan and Gandawan.

One of the most remote areas on a very rough side of the northern peak, Lake Duminagat in 1956 had only one and abandoned house near the lake, once a house of worship. There were no clearings and only a few fish traps in the water. At that time Lake Duminagat was not on the map and only Subanen hunters knew of it. In 1993 it was still a holy place but 20% of the area was cultivated, 40% was grassland, and only the steep mountain sides and ridges, where agriculture is impossible, had an intact forest cover.

Rationale

Integrating participatory principles in the standard methodology for inventory and assessment is important in the preparation of comprehensive land-use plans (CLUP) for the barangays. Moreover, participation of stakeholders in the inventory and assessment is inherently necessary since stakeholders have prior "stakes" on these biodiversity resources. Permanent plots in protected parks are widely used for long-term biodiversity and ecological research.

Determining an appropriate participatory methodology for inventory and assessment of floral resources in the montane forest of Mt. Malindang is a new focus. Community participation in research and development interventions is generally recommended because of many reasons. In biodiversity research, what kind, form, and mode of community participation is effective? Is there statistical proof that participation of local residents, especially the indigenous people, could contribute significantly to scientific results, particularly in conducting inventory and assessment of floral resources? In what specific aspects of floral inventory and assessments will their contributions be significant?

Thus, this project was conducted to obtain knowledge on the development of participatory methodology for inventory and assessment of floral resources and their characterization in two 1-ha plots in the montane forests of Mt. Malindang Range of Don Victoriano, Misamis Occidental. The ultimate hope is to train local researchers, and design protection and conservation strategies as bases for identifying livelihood opportunities (Fig. 1).

Objectives

This project was undertaken to develop an appropriate participatory methodology with the local residents in conducting inventory and assessment of floral resources to generate an understanding of floral resources in Mt. Malindang Forests. Specifically, the project aimed to:

1. determine the species richness and diversity of the flora;
2. build up a database of Subanen indigenous knowledge on plant names and uses;
3. assess the conservation status of the species, e.g., determine if they are endangered, endemic, rare, economically and socioculturally important plants;
4. characterize the vegetation profile of Mt. Malindang Upper Montane Forest;
5. identify species, sites, and habitats of plants for in situ conservation;
6. identify the ethnobotanical uses of plants;
7. design a participatory methodology for inventory and assessment of floral resources; and
8. recommend a livelihood project for biodiversity conservation.

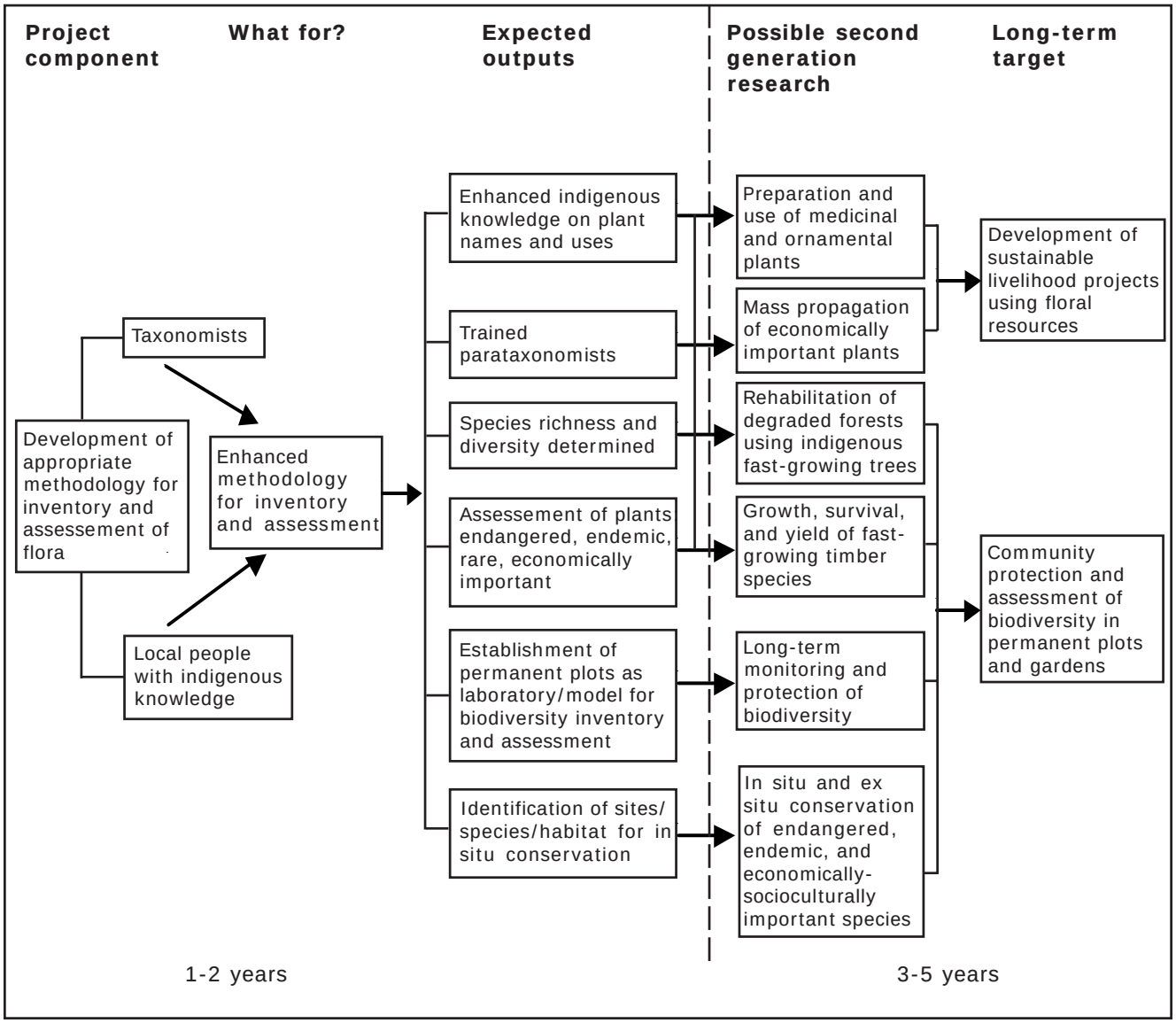


Fig. 1. Project framework.

Methodology

Reentry Protocols and Prior Arrangements

Although a permit was issued for the conduct of this project during the community validation and workshop, a reentry protocol was again conducted. Preparatory activities such as team organization among local participants and researchers, action planning, and training workshop were undertaken (Fig. 2). Nomination and selection of participants were made with the stakeholders in the communities bordering the study sites. Six local researchers (Subanens) were selected for the project - two from each of the three barangays bordering the study sites. Participants selected were those with sufficient to excellent indigenous knowledge of the floral resources of the study sites. Being coresearchers, the participants/ major informers were compensated for their services and involved throughout the duration of the research.

Selection and Location of Study Sites

The study sites were located in Don Victoriano, Misamis Occidental in the montane forests. The first site is situated within Barangay Lake Duminagat at Mt. Ginanlajan in the North Peak Range with an altitude of about 1,600 m above sea level (asl), representing the upper montane forests. The second site, Palo 6, is located within Barangay Mansawan representing the secondary forests.

Although the specific locations of the plots were decided by the stakeholders and the researchers, the selection of the study sites and plots were based on the following criteria:

a. the area should contain high species diversity;

b. there should be an intact forest that is vulnerable to human disturbance and that needs immediate protection and conservation; and

c. the plot must be located within one vegetation type to truly represent a montane forest.

The locations of the two research sites are within the buffer zones but outside of the CADC areas.

The two 1-ha plots established in Barangay Lake Duminagat and Barangay Mansawan are more or less permanent and available for future reassessment and monitoring even beyond the project duration (Figs. 3 and 4). The semipermanent plots served as demonstration center or laboratory for developing a methodology and training local researchers for participatory inventory, assessment, monitoring, and in situ conservation of plants.

Fig. 2. Briefing and orientation of local researchers (Subanens) about the research project.

Fig. 3. Mt. Ginanlajan, Brgy. Lake Duminagat (plot 1).

Fig. 4. Palo 6, Brgy. Mansawan (plot 2).

Description of the Study Sites

Based on the community validation of the project proposal (Fig. 5), the decision of both stakeholders and researchers was to locate the plots along the intact forest approaching Barangay Lake Duminagat at the southwest side of the barangay proper (1,600 m asl). In addition, another plot in Palo 6 (1,650 m asl) located at the southeastern side of Barangay Mansawan, was selected by the stakeholders for comparing the dynamics of the floral resources between primary and secondary forests. They also want to preserve the floral species inside the secondary forests that are threatened due to round timber harvesting.

The geophysical features of the 1-ha plot located in the side slope of the primary forest at Mt. Ginanlajan, Lake Duminagat is characterized by the very steep slopes. The soil is rocky and contains a thick layer of organic matters. Big boulders are scattered within the plot. The ground and boulders are mantled by thick layers of bryophytes. A deep gully crosses at the three-fourths mark of the plot. This drains surface water toward the valley. The plot elevation ranges from 1,560 to 1,660 m asl.

The 1-ha plot located at the saddle of a hill of the secondary forest at Palo 6, Mansawan, is relatively undulating and rolling. The soil is also rocky with big boulders and contains thick layer of organic matters. Similarly, the ground and boulders are covered by thick layer of bryophytes. Surface run-off drains toward the creeks on both sides of the plot. The elevation ranges from 1,600 to 1,675 m asl.

Barangay Lake Duminagat is a crater valley with residential houses and a primary school (Fig. 6). The farms and gardens are located at the base of the mountain bordering the North Peak Mountain Range rising at an elevation of 2,199 m asl. The lake itself is located across the ridge about 1 km away on the western part of the barangay. With an elevation of 1,400 m asl, the lake is almost 10 ha. A shallow stream at the eastern side drains the surface water toward Kalilangan River and ultimately joins the Dapitan River.

Modes of Community Participation

The typology of participation incorporated in the methodology for inventory and assessment of floral resources include the following:

a. Trained parataxonomists joined the researchers from field layout of sample plots up to analysis of results (active participation); and

b. Untrained but knowledgeable key informants again joined the researchers at another stage from field layout up to analysis of results except tagging (active participation).

The intended typologies of participation are from functional to interactive participation (typologies 5 to 6). Thus, two groups of local partners (untrained and trained) were organized to work with the researchers to find out their degree of participation and contribution to scientific results. The participation of the community at large was in the form of giving information and

consultation (typologies 2 and 3) for cross checking. The information generated by the two groups of local participants and researchers relative to ethnobiological aspects were validated by the community and possibly for checking across forest zones.

These groups of participants are expected to apply their experiences and acquired knowledge in periodically preparing comprehensive land-use plans (CLUP) for the barangays, which include watershed development plans and natural resources management plan. This is a requirement by the national government among local government units (LGUs).

Establishment of Biodiversity Plots and Transects

With the involvement of local researchers, a 1-ha plot with an area of 20 x 500 m was established along the contour on the southwest portion of Barangay Lake Duminagat. The first plot on the southwest site represents the primary forest and the second plot at Mansawan represents the secondary forest. Within the 1-ha plot, six 5 x 50 m subquadrats were established for tree profiling, 40 5 x 5 m for the inventory of trees and shrubs and 40 1 x 1 m within each 5 x 5 m subquadrats were added for the inventory of the lower forms (herbs, vines, pteridophytes, bryophytes, lichens and even fungi). All corners of 20 x 500 m plot, 5 x 50 m quadrats, 5 x 5 m subquadrats, and 1 x 1 m subsubquadrats were staked. Strings of different colors representing both sections were tied to the corner stakes. The color coding of strings aided in identifying the quadrats down to the subsubquadrats. The intent was to make these plots more or less permanent for future reassessment even beyond the project duration. The demonstration plots served as training ground for other local groups. Since the trees and other plants within the 1-ha plots were tagged, they became live specimens and references for future research and monitoring by the community and biologists.

The coordinates of the 20 x 500-m plots were determined using GPS. The elevation of all corners of the various quadrats were taken using altimeters, as basis for topographic mapping. Tree tagging and identification started from the two corners of the 5 x 5 m quadrats. The process includes locating, measuring, marking, and mapping all trees with a diameter at breast height (dbh) of 10 cm and up. These information are needed to determine the distribution and habitat associations of trees. In locating the tree, its distance from two corners were measured within the 5 x 5 m quadrats. The diameter at breast height of trees was measured, and located species were tagged using G.I. sheets, labeled, and nailed above the point of diameter measurement facing the baseline of the quadrat with a number consisting

Fig. 5. The Subanens interact during the community validation.

Fig. 6. Crater valley of Brgy. Lake Duminagat with Mt. Ginanlajan as plot site.

of two double digits (e.g., 01-01). The first pair (01) indicates the number of the tree profile quadrat, whereas, the second pair (01) indicates the number of the tagged tree. The first digit may reach 06, representing six 5 x 50-m quadrats for tree profiling, while the second digit can reach as many as the total number of trees tagged within the quadrat of the tree profile. All plant species found within 5 x 5 m and 1 x 1-m quadrats were tagged according to species.

The two groups (with trained and untrained participants) performed the same processes. The first group with trained participants (parataxonomists) did the inventory and assessment ahead. This was followed by the second group with untrained participants using the same field notes doing identification, practices, and other processes done by the first group except tagging. The data generated by both groups were separately processed and evaluated to determine their degree of contribution to scientific results.

Data Collection and Community Participation

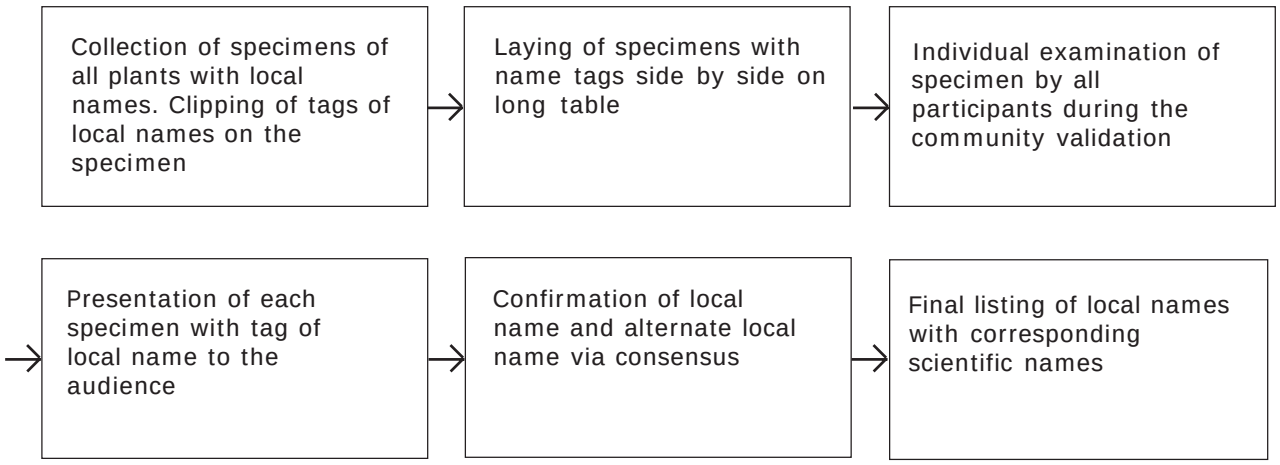
Participatory inventory, collection, and identification of plants

Tagging and identifying plants inside the quadrats and subquadrats were done by the experts and trained Subanen researchers. The process included locating, measuring, and marking all trees with 10-cm dbh and up.

Appropriate legends for tagging trees or lower forms of plants were used for proper data recording.

Local Name & Dialect: _____	Date: _____
Scientific Name: _____	Locality: _____
Family Name: _____	Collection No. _____
Description: _____	Plot/quadrat No. _____
Uses: _____	Habitat: _____
Collector(s): _____	

The local names of plants given by the local researchers were verified/confirmed by the local people through community validation. The flow of community validation is as follows:



All plant groups, viz., angiosperms, gymnosperms, pteridophytes, bryophytes, lichens, and fungi collected were identified by scientific and local names together by researchers and trained Subanen researchers using books, monographs, and taxonomic keys (Rojo 1999, Tan et al 1986, Kalkman et al 1998, De Guzman et al 1986). Indigenous knowledge on how to identify the species was recorded.

For unidentified plant specimens, representative samples were collected and preserved as herbarium specimens for laboratory examination. The preliminary field identification was confirmed by Dutch and Filipino taxonomists using the herbarium specimens prepared by both Subanen researchers and research assistants. The list with specimen vouchers were further cross-checked with the UPLB museum through the assistance of Dr. William Sm. Gruezo.

Interactive ethnobotany survey by Subanen researchers

An ethnobotanical survey of plants inside sample plots was conducted with trained and untrained Subanen researchers as informants and research assistants. They collected and evaluated all medicinal plants, and information about their local names, diagnostic characters, habitat, altitude, and use. Fertile specimens were collected for permanent herbarium retention, while sterile plants were simply tagged for later collection by Subanen researchers who were the main informants on local names and uses of plants.

A list of plant species according to ethnobotanical use, their preparation and possible dosages for particular illnesses or tribal rites was generated by the Subanen researchers.

Community ethnobotany survey

A household survey on ethnobotanical knowledge was not carried out due to the difficulty of contacting all members of the household at one time. A questionnaire was prepared and a survey with 10% sampling intensity with the communities was conducted. This involved quantitative evaluation of plants used as food, timber forest products (construction, poles, piles, etc.) and nontimber forest products (ornamentals, medicinal, basketry, etc.). A list of species, uses, means of preparation, parts of plants used, and dosages was also prepared. Specimens of plants not found in the sample plots were gathered for scientific identification.

During the participatory inventory of plants in the plots, conservation status of floral species was assessed (Table 1). Plants were classified as endangered, endemic, depleted, rare, or economically and socioculturally important based on the definition of International Union for Conservation of Nature (IUCN) (Mace and Stuart 1994), Rojo (1999), Merrill (1926), Zamora and Co (1986), and Statistics on Philippine Protected Areas and Wildlife Resources (2000) as shown below:

a. **Endangered species:** Actively threatened with extinction and survival is unlikely without protective measures.

b. **Rare species:** Not under immediate threat of extinction but occurring in such small numbers or in such localized or specialized habitats that species could quickly disappear if the environment worsens. Needs watching.

c. **Depleted species:** Although sufficiently abundant for survival, the species have been nearly depleted and in decline as a result of natural causes or human activities.

d. **Endemic species:** Confined to a certain geographical region or its parts.

e. **Economically important species:** Based on known usefulness.

Evaluation of current status of indigenous knowledge (IK) within the community

The researchers and Subanen researchers presented the results of the assessment within the plots and outside the plots for validation. The community assessed the trees by giving them a rating of rare (<10 trees) or common (>10 trees), etc. The community validation, represented by 34 participants with 33 men and 1 woman, finally confirmed the local names of the plants and their uses. One or two local names for a particular species were adopted. Several additions in the use, mode of preparation and use, and ailments that can be cured herbally were made.

Vegetation Profile, Species Richness, and Diversity Measurements

Extensive and intensive sampling within the 1-ha plot and rectangular subplots was undertaken. This involved recognition and description of major plant associations, detailed listing of their floral composition, and distribution mapping. Information about the economic, social, and other ecological functions of floral resources came from the same sources.

In measuring species richness and diversity, the following formulas were used:

1. **Density (D)**

$$\text{Density} = \frac{\text{number of individuals}}{\text{area sampled}}$$

2. **Relative Density (RD)**

$$\text{Relative density} = \frac{\text{Density of species A}}{\text{Total density of all species}} \times 100$$

3. **Frequency (F)**

$$\text{Frequency} = \frac{\text{Number of quadrats in which species A occurs}}{\text{Total number of quadrats examined}}$$

4. **Relative Frequency (RF)**

$$\text{Relative frequency} = \frac{\text{Frequency value for species}}{\text{Total of frequency values for all species}} \times 100$$

5. **Dominance (COVER)**

$$\text{Species dominance} = \frac{\text{Species basal coverage values}}{\text{Area sampled}}$$

Note: Basal areas of trees were taken at breast height level (1.3 m above ground adjustments relative to slope), while measurements for other life forms were taken at 3 cm above the ground.

6. **Relative Dominance (RD)**

$$\text{Relative dominance} = \frac{\text{Dominance of species A}}{\text{Total dominance of all species}} \times 100$$

7. **Species Importance Value (SIV)**

As a rough and overall estimate of the influence or importance of plant species in the community, the SIV might be useful and was computed by the following formula:

SIV or ni = RD + RF + Rdom, Where, RD = Relative density, RF = Relative frequency, and Rdom = Relative dominance

8. **Species diversity indices**

The Importance Value of Species A and total IV of all species were computed to obtain Species Diversity using the Shannon Index of General Diversity (H'):

$$H' = - \sum \frac{ni}{N} \log \frac{ni}{N}$$

Where ni = total number of individuals per species
N = total number of individuals of all species

Analysis of Results

Two analytical schemes were undertaken either separately or in complementation with each other. The first used regression analysis wherein the replications were the outputs of 5 x 5-m subquadrats. Independent variables included those generated by the two groups of local participants: no. of species identified, uses, and so on. The dependent variable is the sum of the features indicated by the outputs of the taxonomists and the two groups of Subanen researchers, respectively (total number of species in the 5 x 5-m subquadrats). The significant contributions of each group of local participants were indicated by correlation matrix and significant regression coefficients. This analysis took into account the joint effects of 12 variables (scientific name, official common name, local name, unidentified species made by each of trained, untrained, and botanist groups) on the total identified species. This scheme of analysis accounts for the possible correlation of some variables, such as associations among local names, official common names, and scientific names. Another scheme was the determination of percentage of using scientific names attributed to the effect of training the trained group. The correlation matrix showed that there was a positive correlation between scientific names and official common names provided by the trained group and a negative correlation between local names and official common names (0.577) provided by the trained Subanen researchers. This implied that trained Subanen researchers must have closely associated the scientific names with the official common names. On the other hand, the local names of tree species were inversely correlated with official common names, indicating that trained Subanen researchers tended to focus more on the official common names and less on providing local names of tree species. There was a strong positive correlation between local names provided by trained and untrained Subanen researchers (0.911), implying a close similarity in giving local names to tree species. There is almost a one-to-one correspondence between scientific names of trees provided by botanists and local names provided by trained Subanen researchers (0.86), between local names provided by untrained Subanen researchers and scientific names (0.97). This means that there is a corresponding local name for almost every tree species identified scientifically.

Mode of Project Implementation

The project covered only the upper montane forest ecosystem. The study sites consisting of two plots were in Barangays Lake Duminagat and Mansawan in the Municipality of Don Victoriano. The flowchart of participatory methodology used is shown in Fig. 7.

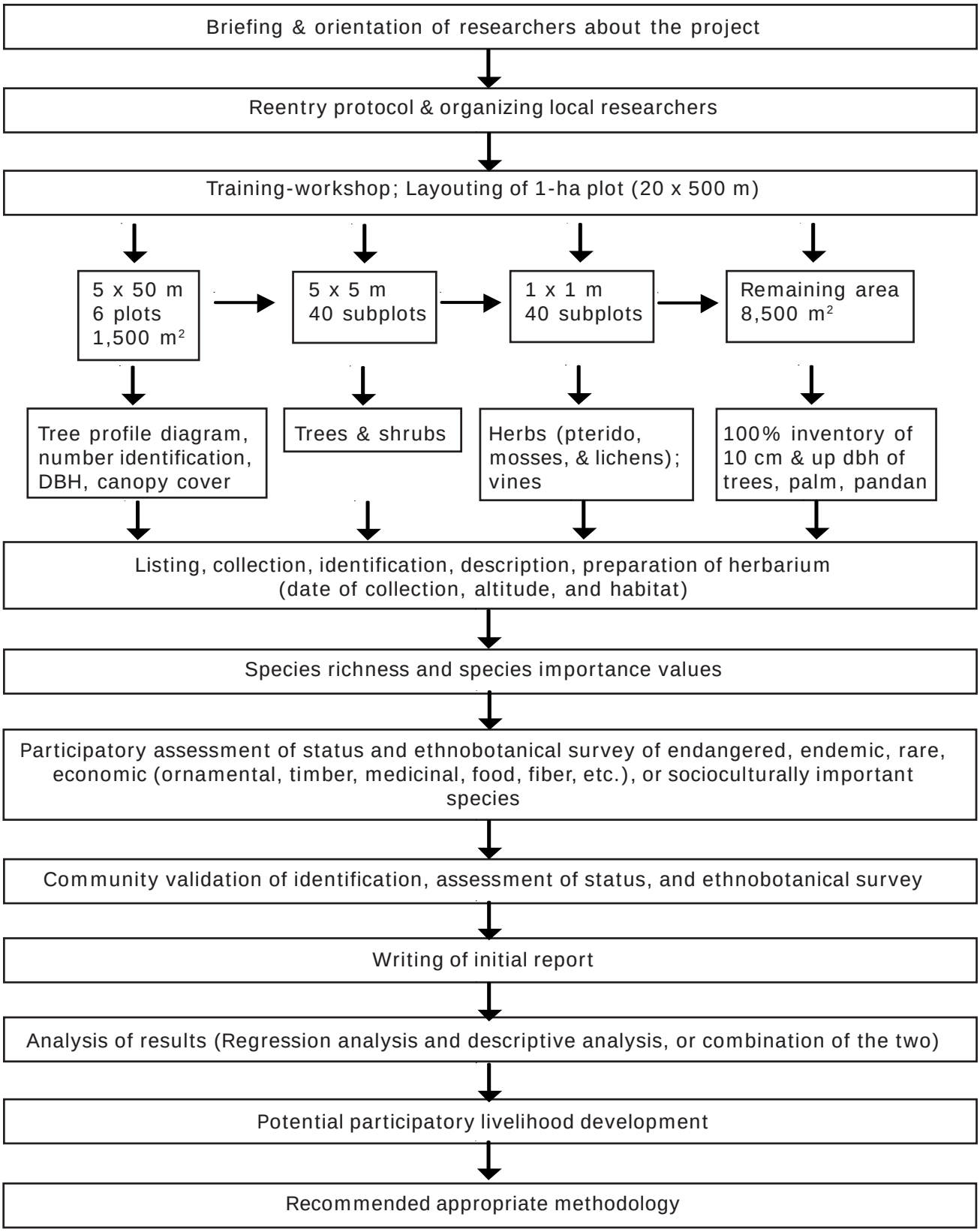


Fig. 7. Flow chart of participatory methodology used.

Results and Discussion

Training of Local Researchers

Training Subanens as local researchers was done by project experts/taxonomists. Three Subanen researchers were trained on inventory techniques, identification and nomenclature, herbarium preparation, assessment of conservation status (endemic, endangered, rare, common, economically and culturally important species), ethnobotanical survey, diversity measurements, use of equipment, tree profiling, and data collection and analysis (Fig. 8). Except for one, all are barangay officials. Two of the trained Subanens are barangay kagawads and one is a barangay secretary. One of the untrained Subanens is a barangay kagawad, one is a barangay treasurer, and one has no position in the community. All are men.

Six Subanen researchers participated in establishing the 1-ha plot with six 5 x 50-m quadrats, 40 5 x 50-m subsubquadrats and 40 1 x 1-m subsubquadrats within the subquadrats established (Fig. 9). The three trained Subanen researchers together with the research assistants tagged the individual representatives of tree and shrub species in the 40 5 x 5-m subquadrats; and herbs, vines, pteridophytes, mosses, lichens, and fungi in the 40 1 x 1-m subsubquadrats for easier identification. The three untrained Subanens did a separate identification of tagged plants based purely on their indigenous knowledge.

After the training and subsequent involvement in conducting the research inventory, the trained Subanen researchers were able to learn the inventory techniques, classify plants by growth habit (tree, shrub, herb, vine) and grouping (bryophytes, lichens, fern-ally, ferns, gymnosperms, and angiosperms). Furthermore, they developed skills in proper documentation, collection, and pressing of specimens for herbarium vouchers. They also taught the untrained Subanen researchers about the indigenous way of pressing and drying specimens.

Fig. 8. Training of local researchers.

Fig. 9. Delineation of 1-ha plot in Mt. Ginanlajan study site.

Analysis of Contribution of Trained and Untrained Subanen Researchers to Developing a Participatory Methodology for Inventory and Assessment of Floral Resources

In determining the contribution of trained and untrained Subanen researchers to the scientific identification of groups of floral species, observations or sampling units are the sample subquadrats of 5 x 5 m for trees and subsubquadrat of 1 x 1 m for lower forms of plants. The number of participants was fixed at three persons each for trained and untrained groups. The aim was to evaluate the effect of training on the scientific identification of trees, lower plant forms, and uses of plants.

Using percentage incremental scientific knowledge of plant identification and uses, untrained participants had not identified any plant scientifically, whereas trained participants had identified 54 (2.5%) species out of 2,143 tree species and 339 (32%) species out of 1,043 species of lower forms of plants. For official common names, the trained Subanen participants identified 235 (10.9%) species out of 2,143 trees and 63 (5.7%) species of lower forms of plants out of 1,083 species. The untrained Subanen participants had identified 59 (2.7%) official common names out of 2,143 trees and one official common name out of 1,083 plants of lower forms.

The significance of their contributions in joint effects with other variables such as local names, unidentified species, and identification made by botanists, are discussed.

1. Tree identification

The stepwise regression showed that the identification of tree species using scientific names and official common names made by both trained and untrained local researchers from the 80 5 x 5-m subquadrats revealed no significant relation or contribution. The significant variables are the scientific name and unidentified species made by botanists that contributed to the total tree species inventory. However, there is an indication that through time trained local researchers have assimilated and applied the use of scientific names. Trends show that from subsubquadrat 1 to 40 no scientific name was identified, while from subsubquadrat 42 to 80 scientific names were already given correctly (Table 2). The use of scientific names corresponding to local names approaches the significant level with an F value of 3.139 (X_{11}), at a probability level of 0.0804. These regression-generated values are based on correlation value and probability level for said variables to enter the regression equation.

This finding is consistent with the general expectation that untrained Subanen researchers have nothing to contribute to the scientific identification of tree species and lower plant forms. If proper training is made, however, Subanen researchers could significantly contribute to identifying the tree species. Yet, the list of local names and the corresponding scientific names is preserved for posterity, an important complementation to the scientific names. Moreover, interested local people could be easily trained, are receptive, and are willing to learn more as the trend showed.

2. Identification of ferns, mosses, and lichens

For lower forms of plants (ferns, mosses, lichens, etc.) and based on 80 subsubquadrats, a different finding was obtained. Trained local researchers have significantly contributed to the scientific identification of lower plant forms. Trained Subanen researchers were forced to use scientific names because they do not have corresponding local names for these lower plant forms which were generally called “pako” (ferns) and “lumot” (mosses) prior to the training (Table 3).

3. Ethnobotanical assessment

The following findings were obtained (based on the data on Tables 4, 5, 6, 7, 8, and 9) for the ethnobotanical assessment in the two 1-ha plots:

a. Both trained and untrained Subanen researchers significantly contributed to identifying medicinal uses of plants together with the botanists’ assessment. This implies that local people place greater attachment value on plants due to the difficulty of availing of commercial medicines.

b. Only the trained Subanen researchers significantly contributed to identifying food plants together with the botanists’ assessment. The training input on this topic made the difference.

c. Together with the botanists’ assessment, the trained Subanen researchers significantly contributed to identifying other uses of plants (construction, firewood, etc.). Again the training input on this topic made the difference.

The results of the regression analysis are also supported by the corresponding correlation matrices.

These findings proved that the participation of Subanen researchers in the inventory and assessment of floral resources is necessary and justified provided that there is proper training and active participation in all aspects of the research project.

4. Identification of plants and basis of local names

Identification of plants

The scientific identification of plants was enriched by the local indigenous knowledge. This was made possible by involving six Subanen researchers in the inventory and identification of plants. The dendrologists/ botanists provided the scientific names of plants including official common names, while the Subanens gave the local names so that an inventory of local names was completed during the 1-year investigation (Tables 10 and 11).

This has resulted from the training of three Subanens as parataxonomists. The identification of plants was done on the spot and cross-checked with taxonomic keys and literature. The specimen vouchers were also referred to the University of the Philippines Los Baños (UPLB) Herbarium for counter checking and confirmation of identification.

It was observed that Subanens gave similar local names to different species, for instance, they gave the name "Gulayan" to two different species of *Lithocarpus*, viz., *L. sulitii* and *L. mindanaensis*. Furthermore, some plants with no local names were given local names based on their uses. One example is *Prunus grisae* which is locally known as "Tanga-tanga" meaning scorpion because its sap is a good remedy for scorpion bites. Another example is *Glochidion canescens* which is called "Tulog-tulog" since it is a good stuff for making "anting-anting" or amulet, making a person invisible. It is said that one who uses this can come and go inside somebody's house leaving the residents undisturbed.

Fig. 10. Community validation meeting/ workshop.

Subanens also named plants based on some of the plant's characters. *Schefflera* spp., is named "Tagima" because of its leaves which are pentafoliately compound. *Sapium luzonicum's* local name is "Baho-baho" meaning "odorous" because its leaves are very odorous. Leaf size is also a basis for deriving a local name; as in "Lumot", a local name for *Dacrydium elatum* since the leaves look like giant moss. Consider also the local name of *Perrottetia alpestris* which is "Dapuan siaw" which means "where the swift birds rest and eat."

Other specific plant characters used by the Subanens in naming plants include the color of the scales or palea in ferns (*Cyathea* spp.), color, smell, and texture of the sap and wood in trees (*Syzygium* spp., *Gordonia*), and size of the entire plant (*Evodia* and *Melicope* spp.) (Tables 10 and 11). For instance "Gantaw puti" or "Gantaw pula" for *Cyathea* spp. is derived from the color of scales or palea. The color of the wood of *Syzygium simile* is white thus it is called "Pulayo puti." Similarly, "Pulayo pula" is the local name for *Syzygium* sp. which has reddish wood.

Comparison of scientific grouping of species with local names

Validated scientific groupings of species according to families and genera were compared with local names. The comparison revealed similar local names of some species belonging to different families and genera (Table 9). Examples are species in genus *Memecylon* under Melastomataceae and genus *Decaspermum* under Myrtaceae, which are locally named "Balikoko." The species of genus *Leea* under Leeaceae family and genera *Euodia* and *Melicope* under Rutaceae family are locally named "Bintuko." This implied that local names had nothing to do with genus and family differentiations. We also discovered a striking similarity in local names and official common names. Prefixes and word repetition are used to differentiate some similar species. The species under Melastomataceae are differentiated using prefixes, for example, "Hantutungaw" and "Tutungaw" from the species Tungaw. Using repetition of name, the local name "Tungaw-Tungaw" is differentiated from "Tungaw" and "Hantutungaw."

Local names provided by the six Subanen researchers were also validated by the community. The local names of trees given by the Subanen researchers were presented to the

communities in the three barangays of Don Victoriano during the validation meeting-workshop. Some of the uncommon plants without local names were given names and some local names were also changed during the meeting. After a thorough discussion all the researchers confirmed the local names of trees collected in the two 1-ha plots in Mt. Malindang Range. Local researchers tended to know more local names of trees than other plant forms such as shrubs, herbs, and vines.

The familiarity of Subanen researchers with the local names of trees could be attributed to their exposure to the forest and the many major uses of trees. Thus to them, a plant that is not used is seldom given a name, but a plant with many uses or that is very common in the community has many local names (Table 10). Since local taxonomies are based on uses, they are usually a source of basic botanical information; they also suggest species that might be developed into market commodities. Also, we cannot assume a one-to-one relationship between the local and the scientific names.

Subanen researchers construct taxonomies of plants based on uses and morphological characteristics. Local people in other countries create extensive and complex taxonomies by compiling information not only on species abundance and distribution of plants (Berlin et al 1974) but also based on soils and ecological communities and successions in their classification schemes (Gomez-Pompa 1987).

5. Ethnobotanical survey

Survey of Subanen researchers within the plots

An ethnobotanical survey was conducted by recording the indigenous knowledge of Subanen researchers regarding the ethnobotanical uses of plants found within the two 1-ha plots. The survey revealed 10 socioculturally important species and 171 economically important species. The economically important species include 39 medicinal species, 14 species of food plants, 18 ornamental plants, and 100 species either for lumber, firewood, and handicraft (Table 13). Preparations of plants for specific uses were annotated as described by local researchers.

Most of the medicinal species are common or cosmopolitan plants. However, prescriptions on the way the Subanens use these plants are either sometimes unique to their community and are based on transferred knowledge through generations. The identification and uses of these ethnobotanical plants were validated by the community. As a result of the validation, the uses and procedures on using these plants were refined based on the accounts of women who used them. It was also found that some community members had forgotten the uses of these plants. Consequently, the local residents were happy and fascinated that these information/survey results were shared to them.

Community ethnobotanical survey

Using ethnobotanical knowledge, local people can design, test, and develop resource use patterns, establish microenterprise and markets, and develop mechanisms for transferring knowledge from one generation to the next.

Of the 247 medicinal plant species mentioned by the residents of the three barangays, *Elephantopus scaber* was the most versatile. It can allegedly cure 16 ailments out of 87 illnesses recorded. *Blumea balsamifera* (14 ailments) is next, followed by *Psidium guajava* (12 illnesses). *Zingiber officinale, Persea americana*, and *Eleusine indica* can cure 11 ailments each, while 10 illnesses can be cured by *Justicia gendarussa, Ficus septica* var. *septica, Artocarpus heterophyllus,* and *Ocimum basilicum* (Tables 14 and 15). Many of these plant species were found outside the plots and at lower elevations. These include exotic or introduced species like *Persea americana* and *Sweitenia macrophylla.*

Of 87 illnesses listed by the local people of Mt. Malindang, fever can be cured using 59 species of herbal plants, while “Pasmo”, wounds, stomach ache, relapses, and cough can be cured using as many as 30 species of herbal plants. These ailments are the most common illnesses that the local people usually experience.

Seventy-nine plant species were recorded as food plants. Fifty-seven or 72% of these are fruits, 25 (32%) are vegetables, 5 (6%) are used as spices, and 6 (8%) can be eaten raw. Results of interviews revealed that the local people never depend much on wild plants for their food but that their knowledge on availability of wild fruits is quite high (Table 16).

The local people use 134 species of plants with economic importance. Fifty-one species (38%) are used for housing construction, 39 (29%) are ornamentals, 16 (12%) are raw materials for handicraft, and 25 species (19%) are used for mat-weaving and as ties. Plants for housing construction are the priority of local people, hence these are more commonly known and are considered of great importance (Table 17).

Seventy-nine socioculturally important species were identified during the community survey. These species are used during courtship, giving birth, burial rites, planting, building a house, and weddings. These are even used for birth control, for protection against fear, and as good luck charm for birthdays and business ventures. Thirty-three percent was used during conception, 24% was important for farming practices, 23% during burial rites, 13% during weddings, and 11% during giving birth. Many species are known to have sociocultural use especially during pregnancy or conception suggesting that local people are much concerned about their health and pregnancy (Table 18).

Participatory characterization of floral resources

Species richness and tree density

A survey of the flora in the two 1-ha plots in Mt. Malindang revealed a total of 301 species, 181 genera, and 113 families. Of these numbers, 167 species were angiosperms, 5 were gymnosperms, 57 were pteridophytes, 61 were bryophytes, and 11 were lichens. Of the two 1-ha plots, plot 2 in Barangay Mansawan showed higher species richness (216 species) than plot 1 in Barangay Lake Duminagat, which had only 202 species. The higher species richness in plot 2 was due to the presence of more species of pteridophytes and bryophytes. The presence of more trees, and abundance of tree ferns and varied habitat types would explain the abundance of pteridophytes and bryophytes in plot 2.

Nineteen angiosperms, 3 lichens, and 11 bryophyte species have not been identified to the species and even up to the genus or family due to the unavailability of fertile organs or even if present, these were difficult to identify (Table 10). These species could be new records in the Philippines or new to science.

Fig. 11. Secondary forest in Palo 6, Mansawan.

A complete inventory of trees in the 2-ha showed a total of 86 species with 67 species found in plot 2 and 63 species in plot 1 (Table 11). These numbers of tree species per hectare basis are extremely high compared with Mt. Kitanglad in Bukidnon which had only 43 tree species per hectare (Pipoly and Madulid 1996). Not only was high tree species richness observed in Mt. Malindang, but a spectacularly high tree density per hectare was also noted, ranging from 961 to 1,000 individuals. This figure is nearly 25% higher than that reported for lowland forests in the Neotropics (Balslev et al 1987, Valencia and Paz 1993) and 15-20% greater than the Neotropical montane forest (Grubb et al 1993).

Species composition and diversity indices

Density. Of 166 trees belonging to 42 species identified in six 5 x 50-m quadrats in Mt. Ginanlajan, Barangay Lake Duminagat, 24 (14%) individuals of *Polyosma philippinensis*, 22 (13%) of *Clethra lancifolia,* and 15 (9%) individuals of *Adinandra robinsonii* were observed in the area. In Palo 6, Barangay Mansawan, of 170 trees from 36 species, *Cyathea brevipes* had the highest density with 45 individuals and a relative density value of 26.48%. This was followed by *Lithocarpus philippinensis* with 21 individuals and a relative density value of 12.36%. The tree fern (*Cyathea brevipes*) also had high density in Mt. Kitanglad (Pipoly and Madulid 1997). Two other species had high density values, viz., *Macaranga dipterocarpifolia* and *Pometia pinnata* with 13 and 12 individuals, respectively and with

relative density values of 7.65% and 7.06%. In two plots, trees with high density values belong to different species.

Frequency. Among the 42 tree species identified within six quadrats in Mt. Ginanlajan, *Clethra lancifolia* and *Polyosma philippinensis* shared the same relative frequency, 6.38% but the latter had two more individuals than the former. This indicated that *Polyosma philippinensis* is more clumped than *Clethra lancifolia*. Likewise, *Calophyllum blancoi* and *Cyathea brevipes* shared the same relative frequency, 5.32%, as well as relative density, 3.61%, which is the same as for *Adinandra robinsonii*. However, the latter has nine more individuals than the two other species. These figures implied that *Adinandra robinsonii* is more clumped than *Calophyllum blancoi* and *Cyathea brevipes*.

The plot in Palo 6 revealed that *Cyathea brevipes* and *Lithocarpus philippinensis* have similar relative frequency (8.22%), but the latter had 19 less individuals. This indicated that the distribution of *Cyathea brevipes* is more clumped than that of *Lithocarpus philippinensis*.

Dominance. The tree species in the 12 quadrats (6 quadrats for each plot) with high density values also had high relative dominance values. These species not only had a high number of individuals but also had higher diameter at breast height (DBH) or basal area. These species have occupied a wide area since dominance is measured by the area occupied by the individual tree within quadrats.

A complete inventory of trees revealed that in the primary forest of Mt. Ginanlajan, the most dominant species was *Clethra lancifolia* with a total value of 130.29 m^2/ha, followed by *Polyosma philippinensis* (117.28 m^2/ha) and then *Adinandra robinsonii* (106.23 m^2/ha). The total dominance values for all species is 740.97 m^2/ha.

In the secondary forest in Palo 6, the most dominant species was *Cyathea brevipes* with 651.89 m^2/ha basal area, followed by *Macaranga dipterocarpifolia* (155.92 m^2/ha) and *Lithocarpus philipinensis* with 148.7 m^2/ha. The total dominance value of all species is 1,277.3 m^2/ha. Despite the lower number of species per hectare in the secondary forest, the number of individuals per species was much higher than those in the primary forest. On the other hand, there were fewer individuals but these had bigger average dbh in the primary forest (Table 19).

Species importance values and diversity index. The inventory of trees within six quadrats (5 x 50 m) in Mt. Ginanlajan, Brgy. Lake Duminagat revealed 42 species with *Polyosma philippinensis* having the highest species importance value (SIV) (22.92%), followed by *Clethra lancifolia* with SIV of 20.8% (Table 19, Fig. 12).

In Palo 6, Brgy. Mansawan, *Cyathea brevipes* had the highest SIV of 78.73%. This supports the observation that *Cyathea* is an indicator of forest disturbance. Its abundance indicated that the area had been logged earlier but had recovered through time. Another tree which had high species importance value was Gulayan (*Lithocarpus philippinensis*) with a value of 36.43% (Table 20, Fig. 13). Thus, this vegetation community may be called a *Cyathea-Lithocarpus* community.

The SIV were similar or within the values obtained for other tropical tree inventories for both lowland and upland forests, which range from 12.5 to 52.4 (Cain et al 1956, Mori et al 1983, Balsev et al 1987, Madulid 1994 4b, Yamada 1976 a and b).

When species diversity index was computed between quadrats in the two plots, quadrat 3 of plot 1 and quadrat 4 in plot 2 obtained high diversity values (1.21). However, when the two plots were compared, plot 1 (primary forest) had higher total species diversity value (1.099) than plot 2 (secondary forest, 0.929). This could be explained by the high importance values obtained in plot 1 (Fig. 14).

Species similarity and difference between plots

Of 78 tree species found in both plots, 20 species were similar. The percentage of tree species similarity between the two plots was quite low (34%) indicating that the two areas are at different stages of succession.

The difference in number (9) of tree species between the sample 1-ha plots for the primary and secondary forests suggests that nine species were probably lost through forest use. Both sites are more or less at the same elevation

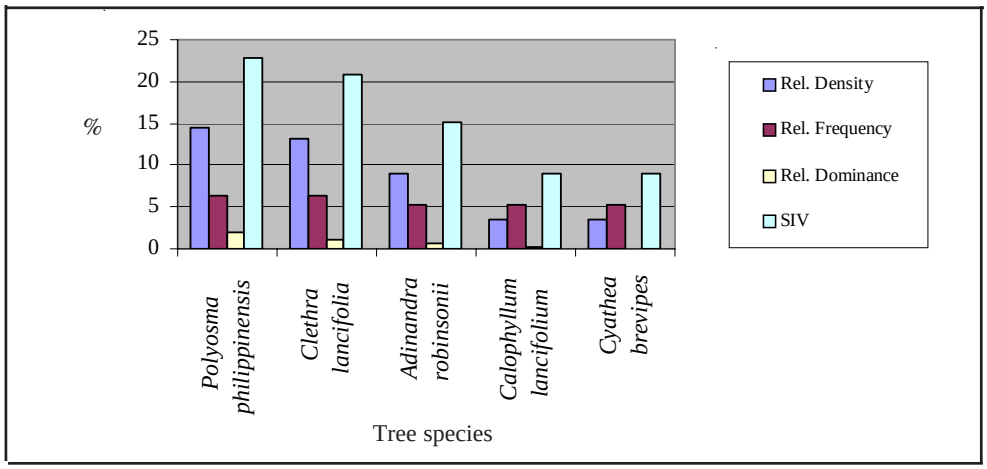


Fig. 12. Tree species composition in Mt. Ginanlajan, Lake Duminagat.

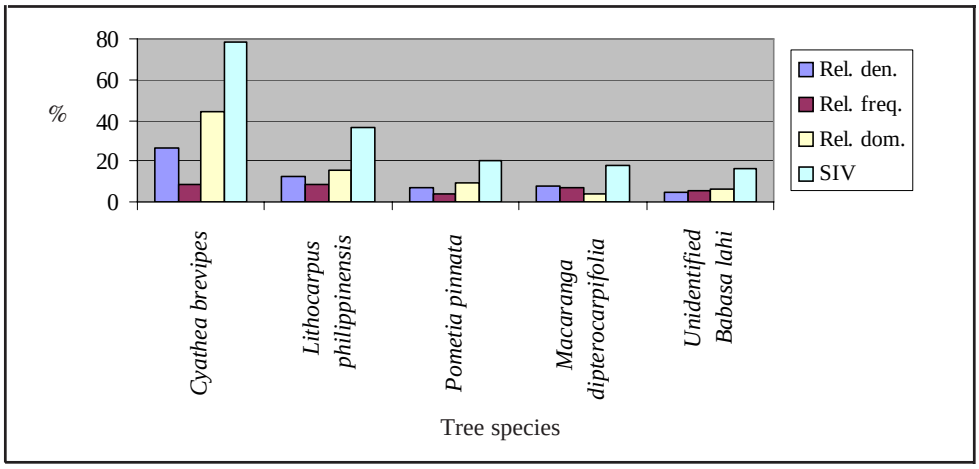


Fig. 13. Tree species composition in Palo 6, Mansawan.

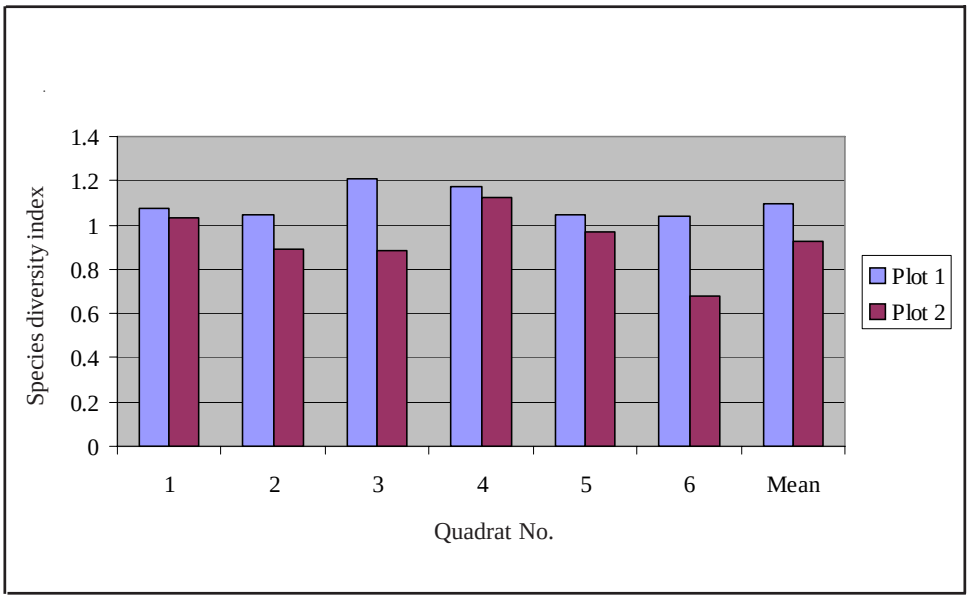


Fig. 14. Species diversity in six quadrats in Mt. Ginanlajan (plot 1) and Palo 6 forests (plot 2).

of about 1,500 m asl. In terms of absence or presence of some tree species, 15 species were absent in the primary forest but present in the secondary forest, compared with 25 tree species absent in the secondary forest but present in the primary forest. These differences could be explained by plant succession - some species are lost due to competition as the forest approaches a climax stage. Once disturbed, new species will grow and succeed.

Among 290 species found within subquadrats and subsubquadrats (5 x 5 m and 1 x 1 m) in two 1-ha plots, only 83 (29%) species were found in Mt. Ginanlajan, Brgy. Lake Duminagat and 95 (33%) were found in Palo 6, Brgy. Mansawan.

These differences could probably be explained by the absence or presence of relevant faunal species and micorrhizal species in the soil associated with the plant species. These were not covered in the study but will be considered in the second generation research. These differences seem to indicate species indicators for site quality, but due to lack of replications, these initial findings remain inconclusive.

Vegetation profile

Mt. Ginanlajan, Brgy. Lake Duminagat

Structure. The 1-ha plot in the montane forest of Mt. Ginanlajan at an altitude of about 1,600 m asl showed relatively few species occupying the first upper layer. Only eight tree species attained a height of 14-16 m. Canopy species included *Flacourtia rukam, Calophyllum lancifolium, Neonauclea media, Polyosma philippinensis, Mastixia premnoides, Parinaria corymbosa, Ardisia* sp. and *Lithocarpus sulitii.* The second layer of the top cover (11-13 m) was occupied by *Ternstroemia megacarpa, Lithocarpus mindanaensis, Pometia pinnata, Clethra lancifolia, Rapanea avenis, Gordonia luzonica* and *Elaeocarpus calomala*. In the third layer at heights ranging from 8 to 10 m, the dominant species were *Clethra lancifolia, Polyosma philippinensis,* and *Adinandra robinsonii*. The fourth layer or the shrub layer (5 to 7 m) was dominated by the same species as in the third layer. In addition, other dominant species include *Sapium luzonicum, Lithocarpus mindanaensis, Euodia confusa, Macaranga dipterocarpifolia* and *Symplocos villarii*. The lowest layer just below the shrub layer (2 to 4 m) included the following species: *Cyathea contaminans* which was dominant, *Hydrangea chinensis, Sapium luzonicum, Ficus septica* var. *septica, Clethra lancifolia* and *Flacourtia rukam.* Unlike the vegetation in Mt. Kitanglad as described by Pipoly and Madulid (1996), the 1-ha plot was characterized by the abundance of endemic palm (*Pinanga philippinensis*).

Palo 6, Brgy. Mansawan

The plot in Palo 6, Barangay Mansawan at an altitude of about 1,650 m asl is a secondary forest (logged over area). The tallest trees (14 to 16 m) which occupied the top canopy level were *Chisocheton pentandrus* and *Dacrydium elatum*. Occupying the second layer of the canopy (11 to 13 m) were *Adinandra montana, Agathis philippinensis, Flacourtia rukam, Ternstroemia megacarpa, Cinnamomum mercadoi, Acer laurinum, Syzygium simile, Macaranga dipterocarpifolia, Sapium luzonicum, Chisocheton pentandrus,* and *Lithocarpus philippinensis*. In the third layer with heights ranging from 8 to 10 m, the dominant species were *Lithocarpus philippinensis, Macaranga dipterocarpifolia,* and *Pometia pinnata*. The fourth, the shrub layer, was characterized by trees 2 to 7 m tall and was dominated by *Cyathea* sp. Just like the study of Brown (1919) in Mt. Makiling, the secondary forest in Palo 6 Malindang Range also showed the dominance of *Cyathea*.

Tree Profile. The six quadrats in the primary forest of Mt. Ginanlajan, Brgy. Lake Duminagat were dominated by Babasa (*Polyosma philippinensis*), Sakam (*Clethra lancifolia*), Tagilumboy (*Adinandra robinsonii*), and Papaga puti (*Rapanea avenis*). However, in the secondary forest in Palo 6, Brgy. Mansawan, tree ferns or Gantaw puti (*Cyathea contaminans*) were abundant, while Gulayan (*Lithocarpus philippinensis*) dominated the area.

The average height of trees, canopy cover, and number of trees were higher in Palo 6 than in Mt. Ginanlajan, which might be due to flat terrain in the former site. Mt. Ginanlajan has steeper slopes which would explain the shorter trees. However, being a primary forest, it has greater tree diameters and is rich in species diversity.

The tallest trees in the primary forest of Mt. Ginanlajan ranged from 14 to 16 m which included: *Flacourtia rukam, Calophyllum lancifolium, Neonauclea media, Polyosma*

philippinensis, Mastixia premnoides, Parinari corymbosa, Ardisia sp., and *Lithocarpus sulitii.*

The tallest trees in the secondary forest of Palo 6, Brgy. Mansawan ranged from 14 to 16 m and included *Chisocheton pentandrus* and *Dacrydium elatum*.

Close canopy cover was observed in quadrat 5 in both Mt. Ginanlajan, Brgy. Lake Duminagat and Palo 6, Brgy. Mansawan. This probably explains the abundance and high species richness of pteridophytes and mosses in the quadrats when compared with quadrats with less canopy cover. The gaps in canopies in some quadrats have indicated forest disturbance and growth of many herbaceous plants but less of the bryophytes and ferns. The average percent canopy cover for all six 5 x 50-m quadrats are 60% and 66% for primary and secondary forests, respectively.

The tree species and tree ferns observed in the six quadrats in Mt. Ginanlajan included *Clethra lancifolia, Polyosma philippinensis, Calophyllum lancifolium, Cyathea contaminans*, and *Adinandra robinsonii,* whereas, *Cyathea contaminans, Lithocarpus philippinensis,* and *Macaranga dipterocarpifolia* were seen in all quadrats in Palo 6. This implies that these species have a faster reproduction rate and have a tendency to dominate the area. Data on specific tree location are important since it gives an idea of where to collect specific tree species in the area for use or protection.

Assessment of status of floral resources within the plots

As basis for protecting and conserving the species, assessment of plant status is necessary. Each species revealed two endangered species, 71 endemic, 11 rare, 171 economically important species, and 10 species of sociocultural importance (Tables 21 and 22).

An endangered plant seen in two plots is *Tmesipteris lanceolata* Dang (Psilotaceae) (Fig. 15). This primitive plant grows only as an epiphyte on the trunk of *Cyathea* spp. and nowhere else. However, the over collection of trunks of *Cyathea* as a medium for growing orchids, anthurium and other epiphytic plants, has endangered the life of *Tmesipteris*. Although not observed within the sampling plots, *Bryum russulum* (Bryaceae) is another endangered plant found only in the 1-ha plot in Mt. Ginanlajan (Fig. 16).

Fig. 15. *Tmesipteris lanceolata* (Psilotaceae).

Fig. 16. *Bryum russulum* (Bryaceae).

The complete inventory of tree species showed that 86 species and 48 (57%) species of these are endemic (Table 11). This percentage became higher when considered on a per hectare basis since species endemism would reach 60% (Table 1). This figure is higher than in Mt. Kitanglad, which only has 47% of species endemism (Pipoly and Madulid 1996). It is noteworthy that some species are site or Mindanao endemic such as *Saurauia involucrata, Saurauia fasciculiflora, Saurauia glabrifolia,* and *Cinnamomum mindanaense* (Figs. 17, 18, and 19). In some cases, reported Luzon endemics are now reported in Mindanao like *Begonia cumingii, Vaccinium jagori,* and *Saurauia fasciculiflora* (Figs. 20 and 21). As to the endemicity of plant groups, the trees and shrubs obtained a high percentage ranging from 33 to 50% while herbs and vines had 11 to 25% endemism (Tables 23, 24, and 25).

Fig. 17. ***Saurauia involucrata.***

Fig. 18. ***Saurauia fasciculiflora.***

Fig. 19. ***Saurauia glabrifolia.***

Many of the floral species have economic importance. As assessed by the Subanen researchers and validated by the community, 171 species of plants were used as food, medicine, ornamental, building materials, handicraft, and/or forage, which is about 60% of the total plant species inventoried.

Another important finding is the discovery of new records of mosses in the Philippines. The three species of mosses new to the Philippines according to Dr. Benito C. Tan include: *Camptochaeta subporotrichoides*, which used to be reported only in Bali to Papua New Guinea and Northern Queensland; *Chaetomitrium horridulum* known from Borneo, Sulawesi, Java and Malay Peninsula; and *Metadistichophyllum rhizophorum* reported only in Borneo and Seram (Figs. 22 and 23). These mosses were observed for the first time in the Philippines within the 1-ha plot in Mt. Ginanlajan, Malindang Range.

Fig. 20. ***Begonia cumingii.***

Fig. 21. ***Vaccinium jagori.***

Fig. 22. ***Camptochaeta subporotrichoides.***

Fig. 23. ***Metadistichophyllum rhizophorum.***

Description of socioculturally important species within the plots

Of the floral species within sampling plots, 10 species were reported by Subanen researchers to have higher sociocultural importance (Table 26). These are used in social occasions such as burial rites, courtship, giving birth or conception, hunting, fishing, farming, and even as personal possession ("anting-anting"). Below are the ten species with higher sociocultural importance:

1. *Solanum* sp. (Gabol) and *Scleria scrobiculata* (Limbas-limbas). These plants are burned after the burial rites as *Pamalina*. The Subanens believe that these species would cast away the bad spirits so as not to harm the living.

2. *Habenaria* sp. (Dalamdam). During courtship, Dalamdam is sometimes used by a desperate man dying to capture the heart of his beloved. This species is considered as *Panglumay*. It could be mixed with perfume to be used during courtship for the girl to accept a suitor's pleas. This can also be placed in a small bottle filled with coconut oil and put on the window pane with the early morning rays of the sun striking it. By chanting the name of the girl being prayed for, she would surely search for the man holding this mysterious stuff (Fig. 24).

3. *Macaranga bicolor* (Labulag). When lovers part ways, there is still a chance for them to be reunited. Either one could place a leaf of this plant under the pillow when sleeping. It is also believed to cast away bad spirits that cause illnesses to new-born babies if its leaves are placed as poultices on the abdomen of a pregnant woman.

4. *Xylaria hypoxylon* (Oten-oten sa unggoy). For couples who want a baby boy, this fungus species is believed to answer their prayers by making it part of the wife's belt or Habak before pregnancy.

5. *Impatiens montalbanica* (Silangka). This species is of great help to pregnant women who are about to give birth. The ripe capsule of this plant is believed to assure women of delivering the baby quickly and easily just by placing it near the feet of the woman about to give birth and letting the capsule dehisce by touching it (Fig. 25).

6. *Gardenia longiflora* (Tamilok). This plant is of great importance to Subanen hunters, who use it for attracting wild cats (Milo). If placed near the bait, it would surely capture one.

7. *Rubus* sp. (Sampinit). Fishermen place the Sampinit's thorny twigs on the fishing pole to attract more fish to the bait, allowing them to have baskets full of fish.

8. *Ficus* sp. (Busyong). For farmers who wish to harvest abundant and bigger sweet potatoes, they would include the fruit of Busyong in the stems of camote during planting. The Subanens believed that if the fruit is included in the first seven seedlings, this would give them a bountiful harvest.

9. *Glochidion canescens* (Tulog-tulog). This plant, sometimes called Tagulilong, is used by some people who wish to be invisible. Tulog-tulog mixed with *Mimosa pudica*, would make a person who wants to visit a loved one's house or who needs protection, invisible, if placed in a bottle of oil accompanied by prayer.

10. Unidentified sp. (Tambabawod) – Parents use this to hasten speaking ability of children who do not speak at a young age by placing the leaf shoot in the mouth.

Fig. 24. ***Habenaria*** **sp. (Dalamdam).**

Fig. 25. ***Impatiens montalbanica*** **(Silangka).**

Potential Livelihood Development Projects for Biodiversity Conservation

During the community validation, the community identified two projects with potential for livelihood. These are briefly described below.

Establishment of nursery

As a result of the inventory of trees in the two 1-ha plots in Malindang Range, 15 species of fast-growing trees were identified and recommended by the Subanens as reforestation species (Table 27 and Fig. 26).

These fast-growing trees will be used in the three barangays of Don Victoriano to reforest denuded areas. Not only are these trees fast-growing, they have other economic uses to the community–for lumber, medicine, food, and others. The Subanen researchers will collect seeds of the fast-growing trees and grow them in the nursery. The seedlings produced will be used by the community to reforest denuded mountains and also for planting along the road and trails to provide shade. As an income-generating project of the community, all visitors/climbers to Mt. Malindang will be asked to buy a seedling from the nursery and plant it as part of the reforestation program. A resolution will be made by the barangay officials regarding this and a project proposal will be prepared for submission to SEARCA-BRP for possible funding. If approved, this could generate income to the community and at the same time promote biodiversity conservation.

Establishment of community economic garden

The Subanen researchers have identified many economically important plants within the two established semipermanent plots and also along the trail from Barangays Mansawan, Gandawan, and Lake Duminagat. These economic plants can be tapped as sources of (a) vegetables for human food, (b) medicine, (c) ornamentals, and (d) raw materials for handicraft making. With information on their uses and financial support from SEARCA-BRP and the LGU, these economic plants can be mass propagated and contribute

Agathis philippinensis
Almaciga

Cinnamomum mercadoi
Kalingag

Dacrydium elatum
Lukinay

Phyllocladus hypophyllus
Tungog

Fig. 26. Some recommended fast-growing trees.

to the socioeconomic benefit of the three barangays through the establishment of a community economic garden (Figs. 27 and 28). This is possible by developing:

a. a community farm for edible plants as cash crops, such as sayote (*Sechium edule*), and pako (*Diplazium esculentum*);

b. plantations for medicinal plants;

c. commercial gardens for plants with ornamental value; and

d. cottage industry for plants with handicraft potential like *Lygodium* spp., *Dicranopteris* spp., *Musa textiles*, *Pandanus* spp., and *Calamus* spp.

Establishing a community economic garden proposed by officials and local members of the community is not only a livelihood project, but is also a strategy in conserving the remaining biodiversity in the forest. This ex situ conservation technique allows the use of plant resources without depleting their natural population in the wild.

Usefulness of the 1-ha permanent plots

The two 1-ha permanent plots established within the primary and secondary forests can be used as a laboratory for botanical inventory and taxonomic training for parataxonomists and budding taxonomists since all the species were already tagged. Monitoring and evaluation of floral dynamics can also be done within these permanent plots through time.

Dicranopteris liniaris

Sechium edule

Phyllocladus hypophyllus

Fig. 27. Plants suitable for the community economic garden.

***Calamus* spp. (food plant)**
Arecaceae

***Freycinetia negrosensis* (medicinal)**
Pandanaceae

***Pandanus* spp. (food plant)**
Pandanaceae

Fig. 28. Habit of some economically important plants.

Summary and Conclusions

Summary of findings

1. Participatory inventory of flora revealed a total of 301 species, 181 genera, and 113 families in the upper montane forest of Mt. Malindang.

2. Complete inventory of trees in the two 1-ha plots showed high species richness (63-67 species), high density (961-1,000 individuals) and high endemism (60%).

3. The trees with high species importance values include Babasa (*Polyosma philippinensis*), Sakam (*Clethra lancifolia*), Gantaw (*Cyathea brevipes*), and Gulayan (*Lithocarpus philippinensis*). These species have various uses to the community.

4. The morphology, uses, odor, size, and color features of plants were used by Subanens in giving the local names.

5. Assessing floral resources revealed two endangered species, viz., *Tmesipteris lanceolata* and *Bryum russulum*.

6. Three species of mosses are new records in the Philippines and are reported for the first time, viz., *Camptochaeta subporotrichoides*, *Chaetomitrium horridulum,* and *Metadistichophyllum rhizophorum*.

7. The survey on sociocultural species revealed 10 species (within the plots) and 79 species (outside the plots) that are used in burial rites, courtship, wedding, conception, hunting, farming, for protection, and personal "charm."

8. Indigenous knowledge of Subanen researchers revealed 171 econonomically important species. Of these, 39 species are medicinal, 14 species are food plants, 18 ornamental plants, and 100 species are used for lumber, firewood, and handicraft. An ethnobotanical survey of the communities revealed 247 medicinal plant species, 79 food plants, and 134 species of economic importance.

9. Active participation of trained Subanen researchers contributed significantly to the scientific results on ethnobotanical and scientific identification of lower forms of plants.

10. Two immediate potential livelihood projects for biodiversity conservation were identified, viz., establishment of a nursery and a community economic garden.

11. Designing a scientific methodology to assess the availability and potential supply of certain forest products in terms of time, distance, and accessibility, cannot be made because of the lack of information/data on these and lack of replications.

Conclusions

1. The most appropriate participatory methodology for the inventory and assessment of floral resources is to employ properly and adequately trained local researchers in all project activities (active participation).

2. The upper montane forest of Mt. Malindang is still very rich in floral biodiversity, an important resource for both **in situ** and **ex situ** conservation in Mindanao.

3. Indigenous knowledge on ethnobotany deepens our understanding on species importance value which could be factored in computing for species value.

Recommendations

Recommended appropriate participatory methodologies for biodiversity assessment:

Integration of participatory principles

Based on the results of the study, participation of local people in biodiversity assessment resulted in the preservation of local nomenclature of floral species corresponding to the scientific names. The significant contribution of local participants is on ethnobotany–by producing the list of food plants, medicinal plants, and other uses. The typology of participation is active and complete, i.e., from planning the activities up to inventory and community validation of results.

Biodiversity interaction and interconnection

In trying to sufficiently explain the interactions and interconnections of biodiversity components (flora, fauna, and socioeconomic and cultural dimensions) within and across ecosystems including vegetative analysis, the following landscape, vegetation type, and geo-morphological characteristics have to be considered:

Size of sample plots. The sample plot sizes should be economical, neither too small nor too large for rapid appraisal, with more replications, sufficient representations from various landscape characteristics, vegetation types, and geomorphological differentiations. In the current sample plot size of 1-ha, longer time is needed to do inventory and appraisal (3 months/1-ha plot) resulting in insufficient replication and representation of landscape characteristics, vegetation types, and geomorphological differentiations. In view of this, a sample plot size of 20 x 20 m is most appropriate and acceptable for forest zones and agroecological zones. This is also consistent with the recommendations in recent biodiversity literature and researches. A 1 x 1 m sample plot for grassland and 5 x 5 m sample plot for brushland can be used due to uniformity of species and economic reasons. Fewer samples on these areas as well as on agroecological zones are also recommended.

Sample size determination. The number of samples depends on the standard sampling techniques used and prescriptions on sampling intensity, and the use of probability sampling. In this situation, the appropriate sampling technique is stratified random sampling with equal sample size per stratum and substratum, wherein sample size determination is built into the sampling technique. The variable that can be used for this computation is number of species per plot, because it is less variable compared with other variables, such as species dominance or species density. This finding is based on the data from 5 x 5-m plots established within the 1-ha sample plots for tree species with 10 cm and up dbh in this study.

Sample distribution in the field. There are two schemes in distributing the samples by subsubstratum and substratum in each of the strata. In this particular case, the strata are the landscape classifications, the substrata are the vegetation types, and the subsubstrata are the southerly and northerly aspects. The first scheme is the simple random distribution where the sample plots are randomly located within the subsubstrata provided there are no overlaps. The second one is systematic distribution wherein the constant distance between sample plots are computed based on the minimum area among subsubstrata. The distribution can be made on the vegetative map where classifications into strata, substrata, and subsubstrata are indicated and located in the field upon implementation. The inventory and assessment in each sample plot can focus on the biodiversity components (flora and fauna, socioeconomic, and cultural factors) that are of interest to the researchers.

Analysis of data. Sufficient data and information on various ecosystems and geomorphological parameters can be generated for biodiversity resources. Links to keystone species or bioindicators can be identified. Interactions and interconnections can be drawn

and explained, paving the way for designing alternative management regimes to rehabilitate and further conserve biodiversity resources across the landscape relative to the cultural landscape. Interactions and interconnections can be analyzed using cross classification of variables, multiple regression, and multivariate analysis.

For LGU

1. The officials (barangay captains) of the three barangays (Mansawan, Gandawan, and Lake Duminagat) of the Municipality of Don Victoriano, Misamis Occidental should prepare a proposal for the identified potential livelihood projects and submit these to SEARCA-BRP and/or LGU for possible initial funding.

2. The barangay officials should formulate a policy requiring all visitors/climbers to plant seedlings to be obtained from the community nursery and by paying a certain amount to be fixed and agreed upon by the community.

3. The two 1-ha semipermanent plots in Mt. Ginanlajan and Palo 6, Mansawan should be protected and managed by their respective barangays. Furthermore, the floral resource dynamics should be monitored and documented by the communities as sources of planting materials in rehabilitation efforts to conserve the rich floral species of the sites.

4. Trained local researchers (parataxonomists) should be tapped by the other barangays in Misamis Occidental as trainors in participatory inventory and assessment for preparing the community land use plan of their respective barangays and to build broader base capability.

5. Disseminate and expand the results by preparing an ethnobotanical guide in the vernacular and English.

6. The three new records of Philippine mosses should be described and published to be recognized worldwide including several unidentified and undescribed floral resources.

7. A similar ethnobotanical survey should be conducted in other barangays with Subanens to countercheck and/or enrich the present findings of the research.

8. Species importance value (SIV) can be enhanced further by injecting the uses of species. A scale of 1-5 representing the range of uses can be factored in.

Literature Cited

Alava, C.G. 2000. Ecosystematic studies of pteridophytes in trunks of African oil palm (*Elaeis guinenses* Jacq.) A poster paper presented during the symposium on the promotion of long-term ecological and biodiversity studies in the Philippines, CMU, Musuan, Bukidnon. 16-17 July 2000. Unpublished.

Alombro, C.N. 2000. Pteridophyte flora of Mt. Malambo, Barangay Datu Salumay, Marilog District, Davao City. A poster paper presented during the symposium on the promotion of long-term ecological and biodiversity studies in the Philippines, CMU, Musuan, Bukidnon. 16-17 July 2000. Unpublished.

Amoroso, C.B., F.M. Acma, and L.A. Cabañeros. 2000. An assessment of dicots in Musuan, Bukidnon. A poster paper presented during the symposium on the promotion of long-term ecological and biodiversity studies in the Philippines, CMU, Musuan, Bukidnon. 16-17 July 2000. Unpublished.

Amoroso, V.B., F. Acma, and H. Pava. 1996. Diversity, status and ecology of pteridophytes in three forests in Mindanao. In: J.M. Camus and R.J. Johns, editors. Pteridology in perspective. p. 53-60. Royal Botanic Gardens, Kew.

Amoroso, V.B. 1997. Ferns of the Philippines. Paper presented during the seminar workshop held at U.P. Diliman on 21 September 1997.

Amoroso, V.B. and F. Mirasol. 2000. Mt. Kitanglad Range Natural Park: A potential long-term ecological research site in Mindanao, Philippines. A paper presented during the symposium on the promotion of long-term ecological and biodiversity studies in the Philippines, CMU, Musuan, Bukidnon. 16-17 July 2000. Unpublished.

Balslev, H.J., L.B. Oligaard and L.B. Holmneiisen. 1987. Composition of adjacent unflooded and flooded plain forest in Amazonian Ecuador. Opera Botanica 92:37-57.

Brown, W. 1919. Vegetation of Philippine mountains. The relation between the environment and physical types at different altitudes. Bureau of Printing, Manila.

Cain, S., M. De Oliveira Castro, J. Murca Pires, and M.T. da Silva. 1956. Application of some phytosociological techniques to Brazilian rainforest. Amer. J. Bot. 43:911-941.

Castillo, M.L.K. and E.S. Fernando. 2000. Long-term biodiversity research plots in the Surigao logging concession: a preliminary assessment. Proceedings of the symposium on the promotion of long-term ecological research and biodiversity studies in the Philippines, CMU, Musuan, Bukidnon. 16-17 July 2000. Unpublished.

Dallmeir, F. 1992. Long-term monitoring of biological diversity in tropical forest areas. Methods for establishment and inventory of permanent plots. MAB Digest Series, II. UNESCO, Paris.

Dallmeir, F. and J.A. Comisky. 1996. From the forest to the user: A methodology update, MANU The biodiversity of Southern Peru. Smithsonian Institute Press. Washington, D.C. p. 41-56.

DENR. 2000. Statistics on Philippine protected areas and wildlife resources. DENR PAWB, Quezon Avenue, Diliman, Quezon City.

De Guzman, E., R. Umali, and E. Sotalbo. 1986. Guide to Philippine flora and fauna. Natural Resources Management Center, Ministry of Natural Resources and University of the Philippines. Vol. III.

Espaldon, V. 2000. The participatory landscape lifescape appraisal and natural resources management. Lecturette during the training of trainors for PLLA/NRM. CMU, Musuan, Bukidnon. Unpublished.

Gonzalez, A.A. 2000. Pteridophytes of Mt. Matutum, South Cotabato. A poster paper presented during the symposium on the promotion of long-term ecological and biodiversity studies in the Philippines, CMU, Musuan, Bukidnon. 16-17 July 2000. Unpublished.

Grubb, P., J. L.T. Pennington and T. Whitmore. 1993. A comparison of montane and lowland rainforest structure in Ecuador. I: Physiogamy and floristics. Journal of Ecology 51:567-601.

Gruezo, W.Sm. 1990. Endangered plants of the Philippines. Life Today 46(8):16-18.

Kalkman, C. et al. 1998. (Edit. Comm.) Flora Malesiana Series. Publications Dept., Rijksherbarium, Leiden, Netherlands.

Lubos, L.C. 2000. Taxonomy, species, and distribution of mosses in selected mountains in Mindanao. Ph.D. Dissertation. CMU, Musuan, Bukidnon.

Mace, G. and Stuart, S. 1994. Draft IUCN red list categories, version 2.2. Species. 21-22:13-24.

Madulid, D. 1991. The endemic genera of flowering plants in the Philippines: Acta Manilana. 39:47-58.

Madulid, D. 1994. A floristic and vegetation study of the Bicol National Park. Manuscript, Philippine National Museum. Manila. 109 p.

Madulid, D. 1995. Plant diversity in the Philippines. In: Biodiversity and terrestrial ecosystems. p 105-109. Institute of Botany, Academia Sinica Monograph Series No. 14.

Madulid, D. 2000. Long-term ecological research and biodiversity studies of the Philippine National Herbarium. Proceedings of the Symposium on the promotion of long-term ecological research and biodiversity studies in the Philippines, CMU, Musuan, Bukidnon. 16-17 July 2000. Unpublished.

Mearns, E.A. 1909. Additions to the list of Philippine birds with descriptions of new and rare species. Proceedings United States National Museum 36:357-360.

Mearns, E.A. 1907. Description of a new genus and nine new species of Philippine birds. Philippine Journal Science 2. A:357-360.

Merrill, E.D. 1926. An enumeration of Philippine flowering plants. Volumes I-IV. Bureau of Printing, Manila.

Mori, S., B. Boom, A.M. de Carvalho, and T. dos Santos. 1983. Ecological importance of *Myrtaceae* in an eastern Brazilian moist forest. Biotropica 15:68-69.

Myers, N. 1988. Threatened BIOTAS: Hotspots in tropical forests. Environmentalists. 8 (3):1-20.

Pipoly, J. and D. Madulid. 1996. Tree inventory in submontane forest of Mt. Kitanglad. Proceedings of Flora Malesiana Symposium. Kew Garden, U.K.

Polacks, M. 2000. The botanical diversity in the Ayawase area. Irian Jaya, Indonesia Biodiversity and Conservation. 9:1345-1375.

Quisumbing, E. 1978. Medicinal plants of the Philippines. Katha Publishing Co., Inc.

Rabor, D.S. 1997. Philippine birds and mammals. UP Press, Quezon City, Philippines.

Rand, A.L. and D.S. Rabor. 1960. Birds of the Philippine Islands: Siquijor, Mount Malindang, Bohol and Samar. Fieldiana Zoology 35, 7:225-441.

Rojo, J.P. 1996. Updated enumeration of Philippine dipterocarps. Sylvatrop, 4:123-145.

Rojo, J.P. 1999. Revised lexicon of Philippine trees. Forest Products Research and Development Institute, Department of Science and Technology, Laguna, Philippines.

Tan, B., E.A. Fernando, and J. Rojo. 1986. An updated list of endangered Philippine plants. Yushania. 3:1-5.

Valencia, R. and G. Paz. 1993. High tree alpha-diversity in Amazonian Ecuador. Yamada, I. 1976a. Forest ecological studies of the montane forest of Mt. Pangrango, West Java. II. Stratification and floristic composition of the forest vegetation of the higher part of Mt. Pangrango. Tonan Ajia Kenkyu (Southeast Asian studies) 13:513-534.

Valencia, R. 1976. Forest ecological studies of the montane forest of Mt. Pangrango, West Java. III. Litter fall of the tropical montane forest near Cibodas. Tonan Ajia Kenkyu (Southeast Asian Studies) 14:194-229.

Zamora, P. and L. Co. 1986. Guide to Philippine flora and fauna. Vol. IV. Goodwill, Quezon City.

Zamora, P. 1991. Urban ferns and fern allies. Kalikasan Press, Quezon City, Philippines.

Table 1. Assessment of plants within subquadrats and subsubquadrats at Malindang Range.

Family/Species	Assessment									
	ECS		DS		RS*		EIS*		VU	
	P1	P2	P1	P2	P1	P 2	P1	P2	P1	P2
A. ANGIOSPERMS										
1. TREES										
I. ACANTHACEAE										
1. *Gratophyllum hortense*							/			
II. ANACARDIACEAE										
2. *Dracontomelon edule* (Bl.) Skeels	/	/			**	**	/	/		
III. ARALIACEAE										
3. *Aralia bipinnata*		/								
IV. BIGNONIACEAE										
4. *Radermachera whitfordi* Merr.		/						/		
V. CLETHRACEAE										
5. *Clethra lancifolia*		/	/		**	**	/	/		
VI. CLUSIACEAE										
6. *Calophyllum blancoi* Pl. & Tr.	/	/			/, **	/, **	/	/		
7. *Calophyllum lancifolium*								/		
VII. CORNACEAE										
8. *Mastixia premnoides* (Elm.) Hallier f.	/	/					/	/		
VIII. ELAEOCARPACEAE										
9. *Elaeocarpus calomala*	/	/			**	**	/	/	/	/
IX. EUPHORBIACEAE										
10. *Glochidion album*	/	/			**	**	/	/		
11. *Macaranga dipterocarpifolia* Merr.					**	**	/	/		
12. *Sapium luzonicum*	/	/	/	/	/, **	/, **	/	/	/	/
13. *Macaranga bicolor*							/			
14. *Glochidion canescens*							/			
X. FAGACEAE										
15. *Lithocarpus mindanaensis* (Elm.) Rend.	/	/			**	**	/	/		
16. *Lithocarpus ovalis* (Bl.) Rend.	/	/			**	**	/			
17. *Lithocarpus philippinensis*							/	/	/	/
18. *Lithocarpus sulitii*					**		/			
XI. FLACOURTIACEAE										
19. *Flacourtia rukam* Zoll. & Mor.					/, *	/, *	/	/		
XII. HYDRANGEACEAE										
20. *Hydrangea chinensis*							/			
XIII. LAURACEAE										
21. *Cinnamomum mercadoi* Vidal		/				/		/		/
22. *Cinnamomum mindanaense* Elm.		/			/, **	/, **		/		/
23. *Eusideroxylon zwageri* Teijsm. & Binn.					*	*		/		
24. *Neolitsea vidalii* Merr.										
25. Unidentified sp.	/	/			*	*	/	/	/	/
XIV. LEEACEAE										
26. *Leea guineensis* G. Don							/			

Table 1. Continued...

FAMILY/SPECIES	Assessment									
	ECS		DS		RS*		EIS*		VU	
	P1	P2	P1	P2	P1	P 2	P1	P2	P1	P2
XV. MAGNOLIACEAE										
27. *Emerillia platyphylla* (Merr.) Noot.	/	/					/	/		
28. *Talauma reticulata*	/	/			*	*	/	/		
XVI. MELASTOMATACEAE										
29. *Astrocalyx calycina*							/			
30. *Astronia cumingiana*	/	/			* *	* *	/	/		
31. *Everettia pulcherrima*					* *	* *	/	/		
32. *Melastoma malabathricum*						* *		/		
33. *Memecylon caeruleum* Jack						* *		/		
XVII. MELIACEAE										
34. *Chisocheton pentandrum*	/					/, * *		/		
35. *Toona calantas* Merr. & Rolfe							/			
XVIII. MORACEAE										
36. *Ficus binnendykii* Mig.										
37. *Ficus botryocarpa* var. *botryocarpa*	/						/	/		
38. *Ficus cardinalicarpa*	/	/			* *					
39. *Ficus irisana* var. *irisana*	/	/					/	/		
40. *Ficus nota*	/	/			* *	* *	/	/		
41. *Ficus septica* var. *septica*					* *	* *	/	/		
42. *Ficus variegata* var. *syncomoides*					* *	* *	/	/		
43. *Ficus odorata*						* *		/		
XIX. MYRSINACEAE										
44. *Ardisia* sp.					*	*	/	/		
45. *Ardisia* sp.								/		
46. *Rapanea avenis* (Bl.) Mig.					* *	* *	/	/		
XX. MYRTACEAE										
47. *Decaspermum fruticosum*						* *		/		
48. *Decaspermum* sp.						* *	/			
49. *Rhodomyrtus* sp.						* *		/		
50. *Syzygium huchinsonii*							/			
51. *Syzygium simile* (Merr.) Merr.		/				*		/		
52. *Syzygium* sp.							/	/		
53. *Unidentified* sp.							/			
XXI. PALMAE										
54. *Pinanga philippinensis*							/			
55. *Pinanga* sp.							/			
XXII. ROSACEAE										
56. *Prunus grisae* var. *grisae*	/	/			* *	* *	/	/		
57. *Parinaria corymbosa*					* *	* *	/	/		
XXIII. RUBIACEAE										
58. *Tarenna* sp.					*	*	/	/		
59. *Gardenia longiflora*										
60. *Neonauclea media*							/			
61. *Wendlandia williamsii*	/	/					/	/		
XXIV. RUTACEAE										
62. *Euodia confusa* Merr.					* *	* *	/	/		

Table 1. Continued...

FAMILY/SPECIES	Assessment									
	ECS		DS		RS*		EIS*		VU	
	P1	P2	P1	P2	P1	P 2	P1	P2	P1	P2
63. *Eurya acuminata*					*		/			
64. *Melicope monophylla* Merr.		/				**		/		
XXV. SAPINDACEAE										
65. *Pometia pinnata* forst.					/,***	/,**	/	/		
66. *Pometia pinnata* forma repanda Jacob						*	/	/		
XXVI. SAURAUIACEAE										
67. *Saurauia elegans*	/						/			
68. *Saurauia fasciculiflora* Merr.	/	/					/	/		
69. *Saurauia glabrifolia*	/						/			
70. *Saurauia involucrata* Merr.	/	/					/	/		
71. *Saurauia latibractea*	/						/			
XXVII. SAXIFRAGACEAE										
72. *Polyosma philippinensis* Merr.	/	/			**	**	/	/		
XXVIII. SYMPLOCACEAE										
73. *Symplocos villarii*					*		/			
74. *Symplocos* sp.					*	*		/		
XXIX. THEACEAE										
75. *Adinandra montana*		/						/		
76. *Adinandra robinsonii*							/			
77. *Adinandra* sp.								/		
78. *Gordonia luzonica*	/	/			**	**		/		
79. *Ternstroemia megacarpa* Merr.	/	/			**	**	/	/		
80. *Pyrenaria mindanaensis*		/					/	/		
XXX. ULMACEAE										
81. *Trema orientalis*								/		
XXXI. URTICACEAE										
82. *Dendrocnide densiflora* (C.B. Rob) Chew	/	/					/	/		
83. *Pilea melastomoides*							/			
XXXII. VERBENACEAE										
84. *Callicarpa eriocloma* Sch.					**	**	/	/		
85. *Clerodendrum macrostegium*							/			
XXXIII. UNIDENTIFIED SPECIES										
86. Ananagon					*	*	/	/		
87. Babasa lahi										
88. Kauban sa babasa						**		/		
89. Lalumaw, lumaw							/			
90. Magamatong lagwis							/			
91. Mangga-mangga							/			
92. Nangka-nangka					**	**		/		
93. Ngilo-ngilo, Sungay-sungay							/	/		
94. Tagibokbok lagpad						*		/		
95. Tambal hubag							/			
96. Tulan manok							/			
97. Unidentified sp.1					*	*	/	/		
98. Unidentified sp.2										

Table 1. Continued...

FAMILY/SPECIES	Assessment									
	ECS		DS		RS*		EIS*		VU	
	P1	P2	P1	P2	P1	P 2	P1	P2	P1	P2
2. SHRUBS										
XXXIV. ACANTHACEAE										
99. *Justicia* sp.							/	/		
XXXV. AMARANTHACEAE										
100. *Gomphrena* sp.										
XXXVI. ARALIACEAE										
101. *Schefflera odorata*	/	/			* *	* *	/	/		
XXXVII. CELASTRACEAE										
102. *Perrottetia alpestris*					* *					
XXXVIII. CHLORANTHACEAE										
103. *Chloranthus elatior*							/	/		
104. *Sarcandra glabra*										
XXXIX. ERICACEAE										
105. *Vaccinium jagori* Warb.		/				* *				
XL. GESNERIACEAE										
106. *Cyrtandra cumingii* C.B. Clarke	/	/			* *	* *				
107. *Cyrtandra parvifolia* Merr.	/	/			*	*	/	/		
108. *Cyrtandra pilosa*							/			
109. *Cyrtandra umbellifera* Merr.		/								
110. *Cyrtandra* sp.						*				
111. *Trichosporum* sp.					* *	* *	/	/		
XLI. LOGANIACEAE										
112. *Fragraea ceilanica*					* *	* *				
XLII. MELASTOMATACEAE										
113. *Medinilla clementis* Merr.	/	/					/	/		
114. *Medinilla cumingii*					* *	* *	/	/		
115. *Memecylon lanceolatum*										
XLIII. POLYGALACEAE										
116. *Polygala* sp.										
XLIV. RUBIACEAE										
117. *Lasianthus appressifolius* Simizu										
XLV. SAXIFRAGACEAE										
118. *Dichroa philipinnensis*	/	/								
XLVI. SOLANACEAE										
119. *Solanum torvum* Sev.										
XLVII. UNIDENTIFIED SPECIES										
120. Tagimahon										

Table 1. Continued...

FAMILY/SPECIES	Assessment									
	ECS		DS		RS*		EIS*		VU	
	P1	P2	P1	P2	P1	P 2	P1	P2	P1	P2
3. HERBS										
XLVIII. ARACEAE										
121. *Arisaema* sp.										
XLIX. BALSAMINACEAE										
122. *Impatiens montalbanica*	/	/					/	/		
L. BEGONIACEAE										
123. *Begonia copelandii* Merr.		/						/		
124. *Begonia cumingii* A. Gray	/	/					/	/		
LI. COMPOSITAE										
125. *Blumea bicolor* Merr.	/	/						/		
LII. CYPERACEAE										
126. *Carex* sp.										
127. *Carex* sp.										
128. *Cyperus* sp.1										
129. *Cyperus* sp.2										
130. *Scleria scrobiculata*										
LIII. GRAMINEAE										
131. *Imperata cylindrica*										
132. *Oplismenus* sp. - Lagitlit										
133. *Paspalum conjugatum* - Lakatan										
LIV. HYPOXIDACEAE										
134. *Molinaria capitulata*										
LV. LAMIACEAE										
135. *Coleus* sp.										
136. Unidentified sp.										
LVI. LILIACEAE										
137. *Dianella caerulata*								/		
LVII. ORCHIDACEAE										
138. *Geodorum* sp.							/			
139. *Goodyera* sp.							/			
140. *Malaxis* sp.								/		
141. *Dendrobium* sp.								/		
142. *Dendrochilum* sp.							/			
143. Unidentified sp.							/			
LVIII. URTICACEAE										
144. *Elatostema pulchellum*	/									
145. *Elatostema* sp.										
146. *Pilea elliptifolia*							/	/		
LIX. ZINGIBERACEAE										
147. *Alpinia* sp.										
148. *Alpinia* sp.								/		

Table 1. Continued...

FAMILY/SPECIES	Assessment									
	ECS		DS		RS*		EIS*		VU	
	P1	P2	P1	P2	P1	P 2	P1	P2	P1	P2
4. VINES / Scandent Shrubs										
LX. ARACEAE										
149. *Scindapsus* sp.										
LXI. ASCLEPIADACEAE										
150. *Hoya* sp.								/		
151. *Dischidia lancifolia*		/					/			
LXII. DIOSCOREACEAE										
152. *Dioscorea* sp.							/			
LXIII. GESNERIACEAE										
153. *Aeschynanthus* sp.										
154. *Dichrotricum chorisepalum* C.B. Clarke		/						/		
LXIV. MORACEAE										
155. *Ficus aurantiaca*										
LXV. PANDANACEAE										
156. *Freycinetia negrosensis*	/	/					/			
LXVI. PIPERACEAE										
157. *Piper retrofractum* Vahl.										
158. *Piper* sp.							/			
LXVII. ROSACEAE										
159. *Rubus* sp.					* *	* *	/			
LXVIII. RUBIACEAE										
160. *Psychotria diffusa* Merr.	/	/								
LXIX. SMILACEAE										
161. *Smilax* sp.						* *				
LXX. VITACEAE										
162. *Cayratia trifolia*										
163. *Cayratia trifolia* var. *cineria*										
LXXI. Unidentified										
164. Darikpal, Sinda-sinda					* *		/			
165. Sibaon's limokon										
166. Tambok-tambok							/			
167. Violet vine										
168. Unknown Vine										
TOTAL	**39**	**48**	**1**	**1**	****-35**	****-42**	**93**	**82**	**4**	**6**

Table 1. Continued...

FAMILY/SPECIES	Assessment									
	ECS		DS		RS*		EIS*		VU	
	P1	P2	P1	P2	P1	P 2	P1	P2	P1	P2
B. GYMNOSPERMS										
I. ARAUCARIACEAE										
1. *Agathis philippinensis*	/				**		/			
II. PODOCARPACEAE										
2. *Dacrycarpus cumingii*	/	/			*	*	/	/		
3. *Dacrydium elatum*						**		/		
4. *Phyllocladus hypophyllus*		/				**		/		
5. *Podocarpus neriifolius*					*					
TOTAL	**2**	**2**	**0**	**0**	****-1 *-2**	****-2 *-1**	**2**	**3**	**0**	**0**

Table 1. Continued...

FAMILY/SPECIES	Assessment											
	ENS		ECS		DS		RS		EIS		VU	
	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2
C. PTERIDOPHYTES												
a. FERN												
I. Aspleniaceae												
1. *Asplenium crinivaule*												
2. *Asplenium decorum*					/	/			/	/		
3. *Asplenium excisum*								/				
4. *Asplenium militare*				/						/		
5. *Asplenium phyllitidis*												
II. Athyriaceae												
6. *Diplaziopsis javanica*										/		
7. *Diplazium tenuifolium*				/				/				
8. *Diplazium trichomanoides*												
9. *Diplazium esculentum*										/		
10. *Diplazium* sp.										/		
III. Cyatheaceae												
11. *Cyathea contaminans*									/	/	/	/
12. *Cyathea brevipes*									/	/		
IV. Davalliaceae												
13. *Araiostegia hymenophylloides*								/	/			
14. *Leucostegia immersa*										/		
15. *Humata obtusata*			/	/								
V. Dennstaedtiaceae												
16. *Microlepia trichosticha*												
VI. Dicksoniaceae												
17. *Cibotium cumingii*										/		
VII. Dryopteridaceae												
18. *Arachnioides amabilis*												
19. *Arachnioides aristata*										/		
20. *Arachnioides dentata*												
21. *Dryopteris sparsa*												
22. *Polystichum elmeri*				/				/				
VIII. Gleicheniaceae												
23. *Gleichenia truncata*												
IX. Grammitidaceae												
24. *Ctenopteris blechnoides*												
X. Hymenophyllaceae												
25. *Hymenophyllum brasii*												
26. *Hymenophyllum crispatum*												
27. *Hymenophyllum emarginatum*												
28. *Hymenophyllum polyanthus*												
29. *Macroglena setacea*												
XI. Lindsaeaceae												
30. *Tapeinidium lineare*										/		
31. *Lindsaea adiatoides*												
32. *Lindsaea lineari*												

Table 1. Continued...

FAMILY/SPECIES	Assessment											
	ENS		ECS		DS		RS		EIS		VU	
	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2	P1	P2
XII. Lomoriopsidaceae												
33. *Elaphoglossum petiolatum*										/		
XIII. Marratiaceae												
34. *Marratiaceae pellucida*										/		
XIV. Oleandraceae												
35. *Oleandra nitida*				/				**				
XV. Plagiogyriaceae												
36. *Palgiogyria pycnophylla*												
XVI. Polydiaceae												
37. *Crypsinus* sp.												
38. *Crypsinus trilobus*												
39. *Goniophlebium argutum*												
40. *Goniophlebium percussum*												
XVII. Pteridaceae												
41. *Pteris longipinnula*												
42. *Pteris tripartite*										/		
43. *Pteris whitfordii*				/				/				
XVIII. Thelypteridaceae												
44. *Chingia christii*												
45. *Christella parasitica*												
46. *Coryphoteris* sp.												
47. *Pneumatopteris costata*									/	/		
XIX. Vittariaceae												
48. *Vittaria elongata*												
b. FERN ALLIES												
XX. Lycopodiaceae												
49. *Lycopodium serratum*									/			
50. *Lycopodium verticillatum*										/		
XXI. Psilotaceae*												
51. *Tmesipteris lanceolata*	/	/										
XXII. Sellaginellaceae												
52. *Sellaginella biformis*												
53. *Sellaginella ciliaris*												
54. *Sellaginella involvens*												
55. *Sellaginella remotifolia*									/	/		
56. *Sellaginella* sp.1												
57. *Sellaginella* sp.2												
TOTAL	**1**	**1**	**1**	**7**	**1**	**1**	**0**	**4**	**7**	**19**	**1**	**1**

Legend:
- * - Rare (Local assessment)
- ** - Common locally
- / - National assessment
- ENS - Endangered Species
- ECS - Endemic Species
- DS - Depleted Species
- RS - Rare Species
- EIS - Economically Important Species
- VU - Vulnerable Species
- Plot 1 (P1) - Mt. Ginanlajan, Barangay Lake Duminagat Submontane Forest*
- Plot 2 (P2) - Palo 6, Brgy. Mansawan Secondary Forest **

Table 2. Summary of identified plants by species within subquadrats (5 x 5 m) in 1-ha plot in Mt. Ginanlajan, Brgy. Lake Duminagat.

Subsub quadrat	Total # Species	Trained Subanen (x_1)				Untrained Subanen (x_2)				Botanist (x_3)		
		X_{11} Sci	X_{12} Local	X_{13} OCN	X_{14} Unk	X_{21} Sci	X_{22} Local	X_{23} OCN	X_{24} Unk	X_{31} Sci	X_{32} OCN	X_{33} Unid.
1	30	0	28	2	0	0	30	0	0	30	21	0
2	31	0	30	0	1	0	31	0	0	30	22	1
3	29	0	27	1	2	0	29	0	0	28	21	1
4	37	0	36	0	1	0	37	0	0	34	24	3
5	23	0	22	0	1	0	23	0	0	23	12	0
6	13	0	12	1	0	0	13	0	0	13	8	0
7	23	0	1	22	0	0	23	1	0	23	16	0
8	34	0	32	1	1	0	33	1	0	34	23	0
9	23	0	22	0	1	0	23	0	0	22	13	1
10	35	0	35	0	0	0	35	0	0	33	24	2
11	35	0	33	0	2	0	35	0	0	33	21	2
12	36	0	35	0	1	0	36	0	0	34	21	2
13	29	0	28	0	1	0	28	1	0	28	19	1
14	24	0	21	1	2	0	23	1	0	23	14	1
15	19	0	18	0	1	0	19	0	0	18	10	1
16	22	0	21	0	1	0	22	0	0	21	13	1
17	30	0	29	1	0	0	29	1	0	29	21	1
18	25	0	25	0	0	0	25	0	0	24	17	1
19	38	0	37	0	1	0	38	0	0	37	24	1
20	36	0	35	0	1	0	36	0	0	34	21	2
21	33	0	33	0	0	0	33	0	0	31	24	2
22	34	0	33	0	1	0	34	0	0	34	25	0
23	32	0	30	1	1	0	30	1	1	29	18	3
24	30	0	30	0	0	0	29	1	0	29	20	1
25	32	0	32	0	0	0	32	0	0	32	21	0
26	28	0	27	0	1	0	28	0	0	27	18	1
27	28	0	27	0	1	0	28	0	0	28	20	0
28	16	0	16	0	0	0	16	0	0	16	9	0
29	32	0	30	0	2	0	32	0	0	31	18	1
30	30	0	28	1	1	0	29	1	0	29	19	1
31	29	0	28	0	1	0	29	0	0	27	18	2
32	32	0	32	0	0	0	31	1	0	29	21	3
33	30	0	28	0	2	0	30	0	0	28	18	2
34	30	0	29	1	0	0	29	1	0	28	20	2
35	22	0	21	0	1	0	22	0	0	21	15	1
36	22	0	21	0	1	0	22	0	0	20	15	2
37	35	0	35	0	0	0	35	0	0	33	22	2
38	38	0	38	0	0	0	37	0	0	36	27	2
39	28	0	27	1	0	0	27	1	1	28	19	1
40	39	0	39	0	1	0	39	0	0	38	28	1
41	21	0	21	0	0	0	21	0	0	20	15	1
42	33	1	30	3	0	0	31	0	2	29	21	4
43	24	0	23	1	0	0	23	0	1	21	16	3
44	38	0	37	0	1	0	35	0	3	35	21	3
45	24	2	13	9	0	0	22	1	1	23	16	1
46	9	0	7	2	0	0	9	1	0	9	6	0
47	28	1	20	7	0	0	25	2	1	27	19	1
48	17	1	13	3	0	0	15	1	1	17	12	0
49	25	2	20	3	0	0	24	0	1	25	14	0
50	22	1	16	5	0	0	18	2	2	21	16	1
51	35	2	28	5	0	0	30	2	3	33	24	2
52	24	3	16	5	0	0	21	1	2	23	15	1
53	17	1	14	2	0	0	15	1	1	16	10	1
54	21	1	14	6	0	0	19	1	1	21	14	0
55	28	2	17	9	0	0	23	2	3	26	17	2

Table 2. Continued...

Subsub quadrat	Total # Species	Trained Subanen (x_1)				Untrained Subanen (x_2)				Botanist (x_3)		
		X_{11} Sci	X_{12} Local	X_{13} OCN	X_{14} Unk	X_{21} Sci	X_{22} Local	X_{23} OCN	X_{24} Unk	X_{31} Sci	X_{32} OCN	X_{33} Unid.
56	8	1	7	0	0	0	7	0	1	8	3	0
57	33	3	24	6	0	0	31	1	1	30	22	3
58	31	1	23	7	0	0	30	1	0	29	21	2
59	28	2	19	7	0	0	27	1	0	27	22	1
60	22	0	16	5	0	0	20	1	1	18	16	4
61	31	1	22	6	0	0	30	0	1	29	23	2
62	21	1	16	4	0	0	21	0	0	20	14	1
63	17	0	14	3	0	0	16	1	0	17	11	0
64	28	2	19	7	0	0	24	0	4	25	15	3
65	20	1	9	10	0	0	18	1	1	20	13	0
66	14	1	10	3	0	0	12	1	1	14	8	0
67	33	1	23	9	0	0	28	3	2	33	20	0
68	24	2	15	7	0	0	22	1	1	23	18	1
69	23	1	15	6	0	0	19	3	1	22	15	1
70	31	4	17	10	0	0	25	3	3	29	21	2
71	23	1	18	4	0	0	20	3	0	20	15	3
72	31	2	23	6	0	0	27	1	3	29	19	2
73	25	2	19	4	0	0	22	2	1	24	17	1
74	34	2	23	8	0	0	28	4	2	33	23	1
75	28	2	17	9	0	0	26	1	0	26	20	2
76	20	1	14	5	0	0	17	2	1	20	11	0
77	13	1	10	2	0	0	10	2	1	13	6	0
78	30	4	18	8	0	0	27	2	1	27	18	3
79	17	0	15	2	0	0	17	0	0	17	12	0
80	20	1	15	4	0	0	20	0	0	19	14	1
Total	**2143**	**54**	**1821**	**235**	**31**	**0**	**2035**	**59**	**50**	**2043**	**1393**	**101**

Where:
$X_{11, 21, 31}$–Scientific name, $X_{12, 22}$–Local Name, $X_{13, 23, 32}$–Official common name, and $X_{14, 24, 33}$–Unidentified

Table 3. Summary of identified plants by species within sub-subquadrats (1 x 1 m) in 1-ha plot at Mt. Ginanlajan, Brgy. Lake Duminagat

Subsub quadrat	Total # Species	Trained Subanen (x_1)				Untrained Subanen (x_2)				Botanist (x_3)		
		X_{11} Sci	X_{12} Local	X_{13} OCN	X_{14} Unk	X_{21} Sci	X_{22} Local	X_{23} OCN	X_{24} Unk	X_{31} Sci	X_{32} OCN	X_{33} Unid.
1	17	0	11	1	5	0	16	0	1	16	3	1
2	5	0	3	0	2	0	5	0	0	5	1	0
3	9	0	6	0	3	0	9	0	0	9	4	0
4	6	0	4	0	2	0	6	0	0	6	2	0
5	9	0	8	0	1	0	9	0	0	8	2	1
6	7	0	6	0	1	0	7	0	0	7	2	0
7	15	0	10	0	5	0	15	0	0	13	4	2
8	8	0	6	0	2	0	8	0	0	8	4	0
9	13	0	9	0	4	0	13	0	0	12	2	1
10	15	0	11	0	4	0	15	0	0	14	3	1
11	22	0	13	0	9	0	21	0	1	21	4	1
12	7	0	5	0	2	0	7	0	0	6	2	1
13	16	1	9	0	6	0	16	0	0	16	3	0
14	23	2	12	0	9	0	23	0	0	22	5	1
15	12	0	8	0	4	0	12	0	0	12	2	0
16	8	0	7	0	1	0	8	0	0	6	1	2
17	16	1	13	0	2	0	16	0	0	16	4	0
18	6	0	4	0	2	0	6	0	0	5	1	1
19	12	0	7	0	5	0	11	0	1	12	2	0
20	11	0	8	0	3	0	11	0	0	11	2	0
21	11	0	8	0	3	0	10	0	1	9	11	2
22	15	1	11	0	3	0	14	0	1	15	3	0
23	14	0	14	0	5	0	19	0	0	15	4	4
24	13	0	8	0	5	0	12	0	1	11	2	2
25	25	1	19	0	5	0	24	0	1	24	6	1
26	4	0	4	0	0	0	4	0	0	3	0	1
27	28	10	13	4	1	0	27	0	1	25	7	3
28	11	5	5	1	0	0	9	0	2	10	2	1
29	9	2	5	2	0	0	9	0	0	9	2	0
30	6	2	4	0	0	0	4	0	2	3	1	3
31	12	4	6	2	0	0	12	0	0	12	5	0
32	8	4	3	1	0	0	7	0	1	8	2	0
33	14	4	8	2	0	0	14	0	0	14	3	0
34	17	4	11	2	0	0	17	0	0	16	3	1
35	15	5	9	1	0	0	15	0	0	15	2	0
36	18	6	8	4	0	0	18	0	0	16	5	2
37	18	6	7	5	0	0	18	0	0	18	6	0
38	16	4	11	1	0	0	15	0	1	12	2	4
39	12	5	7	0	0	0	11	0	1	12	1	0
40	9	4	3	2	0	0	9	0	0	9	2	0
41	7	2	4	1	0	0	7	0	0	5	1	2
42	14	10	4	0	0	0	14	0	0	13	4	1
43	13	8	5	0	0	0	11	0	2	13	3	0
44	5	4	1	0	0	0	5	0	0	5	1	0
45	16	7	7	2	0	0	12	0	4	16	5	0
46	6	2	3	0	1	0	5	0	1	6	1	0

Table 3. Continued...

Subsub quadrat	Total # Species	Trained Subanen (x_1)				Untrained Subanen (x_2)				Botanist (x_3)		
		X_{11} Sci	X_{12} Local	X_{13} OCN	X_{14} Unk	X_{21} Sci	X_{22} Local	X_{23} OCN	X_{24} Unk	X_{31} Sci	X_{32} OCN	X_{33} Unid.
47	22	12	8	2	0	0	20	0	2	20	6	2
48	15	8	6	1	0	0	14	0	1	15	1	0
49	15	7	8	0	0	0	12	0	3	12	3	3
50	19	6	13	0	0	0	16	0	3	19	3	0
51	20	10	9	1	0	0	15	0	5	17	5	3
52	21	10	8	2	1	0	18	0	3	21	5	0
53	12	6	4	2	0	0	8	0	4	12	5	0
54	19	5	14	0	0	0	17	0	2	19	2	0
55	12	5	5	2	0	0	12	0	0	12	4	0
56	6	5	1	0	0	0	5	0	1	6	2	0
57	14	9	4	1	0	0	13	0	1	13	5	1
58	18	11	6	1	0	0	18	0	0	16	5	2
59	20	11	7	2	0	0	19	0	1	17	4	3
60	18	9	7	2	0	0	18	0	0	16	5	2
61	6	2	3	1	0	0	6	0	0	4	1	2
62	19	6	11	2	0	0	19	0	0	16	3	3
63	8	1	7	0	0	0	8	0	0	8	0	0
64	24	6	16	1	1	0	18	0	6	21	3	3
65	10	4	5	1	0	0	8	0	2	10	3	0
66	20	8	12	0	0	0	14	0	6	20	2	0
67	16	7	8	1	0	0	15	0	1	15	3	1
68	17	8	9	0	0	0	14	0	3	17	2	0
69	8	5	2	1	0	0	8	0	0	8	2	0
70	18	9	9	0	0	0	13	0	5	16	1	2
71	13	6	6	1	0	0	11	0	2	12	3	1
72	19	11	6	2	0	0	16	0	3	19	5	0
73	13	7	6	0	0	0	12	0	1	13	2	0
74	16	7	8	1	0	0	13	0	3	16	4	0
75	16	12	4	0	0	0	14	0	2	16	3	0
76	13	5	8	0	0	0	10	0	3	12	0	1
77	10	5	4	1	0	0	10	0		10	3	0
78	18	8	8	2	0	0	17	0	1	18	4	0
79	7	1	5	1	0	0	5	1	1	7	1	0
80	8	3	4	1	0	0	6	0	2	6	3	2
Total	**1083**	**339**	**589**	**63**	**97**	**0**	**998**	**1**	**89**	**1018**	**240**	**70**

Where:
$X_{11, 21, 31}$–Scientific name, $X_{12, 22}$–Local Name, $X_{13, 23, 32}$–Official common name, and $X_{14, 24, 33}$–Unidentified

Table 4. Medicinal uses of plants in Mt. Ginanlajan (primary forest), Malindang Range identified in coordination with local researchers.

Species (no.)	Y_1 Total uses	X_1 Trained	X_2 Untrained	X_3 Botanist
1	2	1	1	1
2	2	0	0	2
3	4	4	0	0
4	5	4	2	1
5	3	0	0	3
6	1	1	1	0
7	11	5	4	7
8	4	0	0	4
9	1	0	0	1
10	6	1	1	4
11	1	1	1	0
12	2	2	0	0
13	2	1	1	0
14	4	0	0	4
15	1	0	1	0
16	3	1	2	0
17	1	1	0	0
18	1	1	0	0
19	1	1	0	0
20	4	3	1	0
21	6	0	0	6
22	1	0	1	0
23	1	1	0	0
24	2	1	1	0
25	1	0	1	0
26	4	1	2	2
27	15	1	1	13
28	1	0	0	1
29	1	1	0	0
30	1	1	0	0
31	2	1	2	0
32	2	1	2	0
33	3	0	0	3
34	1	1	0	0
35	2	0	0	2
36	1	1	0	0
37	1	1	0	0
38	2	2	0	0
39	1	1	0	0
40	4	1	1	3
41	4	1	0	3
42	1	1	1	0
43	1	1	0	0
44	4	0	0	4
45	3	1	1	2
46	3	2	1	0
47	3	1	3	0
48	2	1	1	0
49	1	1	0	0
Total	**133**	**51**	**33**	**66**

Table 5. Food plants in Mt. Ginanlajan (primary forest), Malindang Range identified in coordination with local researchers.

Species (no.)	Y_1 Total uses	X_1 Trained	X_2 Untrained	X_3 Botanist
1	2	2	2	0
2	1	1	1	0
3	1	1	1	0
4	1	1	1	0
5	2	0	0	2
6	1	0	1	0
7	1	0	0	1
8	2	2	0	0
9	1	0	1	0
10	1	1	1	0
11	2	0	0	2
12	1	1	1	0
13	1	1	0	0
14	1	1	0	0
15	2	0	0	2
16	1	1	1	0
17	1	0	1	0
18	1	1	0	1
19	1	1	0	0
20	1	1	0	0
21	1	1	0	0
22	1	1	1	0
Total	**27**	**17**	**12**	**8**

Table 6. Other uses of plants in Mt. Ginanlajan (primary forest), Malindang Range identified in coordination with local researchers.

Species	Y_1 Total uses	X_1 Trained	X_2 Untrained	X_3 Botanist
1	2	2	2	0
2	2	2	2	0
3	1	1	0	0
4	2	2	2	0
5	2	2	2	0
6	1	1	1	0
7	2	2	2	0
8	1	1	1	0
9	4	2	3	2
10	2	1	1	1
11	3	2	2	2
12	1	1	0	0
13	3	2	2	1
14	3	2	2	1
15	3	2	2	1
16	2	2	2	0
17	2	2	1	0
18	10	2	2	9
19	3	2	2	1
20	2	2	2	0
21	2	2	2	0
22	2	2	2	0
23	2	2	2	0
24	3	2	2	2
25	2	2	2	0
26	2	2	2	0
27	2	2	2	0
28	2	2	2	0
29	1	1	1	0
30	2	2	1	0
31	1	1	1	0
32	1	1	1	0
33	1	1	1	0
34	1	1	1	0
35	3	3	2	1
36	1	1	1	0
37	2	2	2	0
38	2	2	2	0
39	2	2	2	0
40	2	2	2	0
41	1	1	1	0
42	2	2	2	0
43	1	1	1	1
44	1	1	0	0
45	2	2	2	0
46	2	2	2	0
47	2	2	1	0
48	2	2	2	0
49	4	2	2	2
50	1	0	0	1
51	2	2	2	0
52	2	2	2	0
53	1	1	1	1
54	1	1	1	1
55	3	3	2	0
56	2	2	2	0
57	2	2	2	1

Table 6. Continued...

Species	Y_1 Total uses	X_1 Trained	X_2 Untrained	X_3 Botanist
58	1	1	1	0
59	1	1	1	0
60	4	2	2	3
61	1	1	1	0
62	3	3	3	0
63	2	2	2	0
64	2	2	2	0
65	2	2	2	0
66	2	2	2	0
67	2	2	2	0
68	2	2	2	0
69	2	2	2	1
70	5	2	2	4
71	2	2	2	0
72	4	3	2	0
73	3	3	1	1
74	2	2	2	0
75	2	2	2	0
76	2	2	2	0
77	2	2	2	0
78	2	2	2	0
79	3	2	2	1
80	2	1	1	1
81	2	2	2	0
82	2	2	2	0
83	2	2	2	0
84	2	2	2	0
85	2	2	2	0
86	2	2	2	0
87	2	2	2	0
88	2	2	2	0
89	5	2	2	3
90	6	1	1	4
91	2	2	2	0
92	2	2	2	0
93	2	2	2	0
94	2	2	2	0
95	2	2	2	0
96	2	2	2	0
97	2	2	2	0
98	2	2	2	0
99	2	2	2	0
100	2	2	2	0
101	2	2	2	0
Total	**220**	**184**	**174**	**46**

Table 7. Specific uses of medicinal plants in Palo 6 (secondary forest), Barangay Mansawan assessed in coordination with local researchers.

Species (no.)	Y_1 Total uses	X_1 Trained	X_2 Untrained	X_3 Botanist
1	4	4	0	0
2	4	4	0	0
3	4	3	2	1
4	3	0	0	3
5	3	0	0	3
6	1	1	1	0
7	2	0	1	1
8	9	4	1	9
9	4	0	0	4
10	2	0	0	1
11	5	1	1	4
12	1	1	1	0
13	1	1	0	0
14	2	1	1	0
15	4	0	0	4
16	1	0	1	0
17	1	0	1	0
18	1	1	0	0
19	4	3	3	0
20	6	0	0	6
21	1	1	0	0
22	18	1	0	17
23	1	0	1	0
24	2	0	0	1
25	15	1	1	13
26	1	0	0	1
27	2	1	2	0
28	3	0	0	3
29	2	0	0	2
30	1	1	0	0
31	1	1	0	0
32	18	0	1	17
33	2	2	0	0
34	1	1	0	0
35	4	0	1	3
36	4	1	0	3
37	12	0	1	11
38	1	1	1	0
39	1	1	0	0
40	3	0	0	4
41	3	1	1	2
42	2	1	1	0
43	1	0	1	0
44	3	1	3	0
45	1	1	0	0
Total	**165**	**40**	**27**	**113**

Table 8. Other uses of plants in Palo 6 (secondary forest), Barangay Mansawan assessed in coordination with local researchers.

Species (no.)	Y_1 Total uses	X_1 Trained	X_2 Untrained	X_3 Botanist
1	2	2	2	0
2	2	2	2	0
3	1	0	1	0
4	2	2	2	0
5	2	2	1	0
6	1	1	1	0
7	1	1	1	1
8	1	1	1	1
9	4	2	3	2
10	2	1	1	1
11	3	2	2	2
12	1	1	0	0
13	3	2	2	1
14	2	2	2	0
15	3	2	2	1
16	3	2	2	1
17	2	2	1	0
18	10	2	2	9
19	3	2	2	1
20	1	1	0	0
21	2	2	2	0
22	2	2	2	0
23	2	2	2	0
24	2	2	2	0
25	3	2	2	2
26	2	2	2	0
27	2	2	2	0
28	2	2	2	0
29	2	2	2	0
30	1	1	1	0
31	2	2	1	0
32	1	1	1	0
33	1	1	1	0
34	3	3	2	1
35	1	1	1	0
36	2	2	2	0
37	2	2	2	0
38	1	1	1	1
39	2	2	2	0
40	2	2	1	0
41	2	2	2	0
42	1	1	1	1
43	2	2	2	0
44	2	2	2	0
45	2	2	2	0
46	3	3	2	0
47	2	2	2	0
48	2	2	2	1
49	4	2	2	3
50	1	1	0	0
51	3	3	3	0
52	2	2	2	0
53	2	2	2	0
54	2	2	2	1
55	5	2	2	4
56	1	0	0	1
57	1	1	1	0

Table 8. Continued...

Species (no.)	Y_1 Total uses	X_1 Trained	X_2 Untrained	X_3 Botanist
58	2	2	2	0
59	4	3	2	0
60	3	3	1	1
61	2	1	1	1
62	2	2	2	0
63	2	2	2	0
64	2	2	2	0
65	2	2	2	0
66	2	2	2	0
67	5	2	2	3
68	7	1	1	5
69	1	0	1	0
70	2	2	2	0
71	2	2	2	0
Total	**161**	**125**	**116**	**45**

Table 9. Uses of food plants in Palo 6 (secondary forest), Barangay Mansawan assessed in coordination with local researchers.

Species (no.)	Y_1 Total uses	X_1 Trained	X_2 Untrained	X_3 Botanist
1	1	1	0	0
2	2	2	2	0
3	1	1	1	0
4	1	1	1	0
5	1	1	1	0
6	1	1	1	0
7	2	0	0	2
8	1	0	1	0
9	1	1	1	0
10	2	1	1	1
11	1	0	0	1
12	2	2	0	0
13	1	0	1	0
14	1	1	1	0
15	2	0	0	2
16	1	1	0	0
17	2	0	0	2
18	1	0	1	0
19	1	0	0	1
20	1	1	0	0
Total	**26**	**14**	**12**	**9**

Table 10. Species within subquadrats and subsubquadrats in two 1-ha plots in Mt. Malindang.

Family/Species	Local name	Distribution Plot 1	Plot 2
A. ANGIOSPERMS			
I. ACANTHACEAE			
1. *Justicia* sp.	Babakag	/	/
II. AMARANTHACEAE			
2. *Gomphrena* sp.	Sinaw-sinaw	/	/
III. ANACARDIACEAE			
3. *Dracontomelon edule* (Bl.) Skeels	Magabyalong, Byalong	/	/
IV. ARACEAE			
4. *Arisaema* sp.	Unknown		
5. *Scindapsus* sp.	Labid	/	/
V. ARALIACEAE			
6. *Aralia bipinnata* Blco.	Suha-suha		/
7. *Schefflera odorata* (Blco.) Merr. & Rolfe	Tagima	/	/
VI. ASCLEPIADACEAE			
8. *Dischidia lancifolia* Merr.	Christmas tree	/	
9. *Hoya* sp.	Christmas tree		/
VII. BALSAMINACEAE			
10. *Impatiens montalbanica* Hook.	Silangka	/	/
VIII. BEGONIACEAE			
11. *Begonia copelandii* Merr.	Mamangpang		/
12. *Begonia cumingii* A. Gray	Mamangpang	/	/
IX. BIGNONIACEAE			
13. *Radermachera whitfordi* Merr.	Magasili		/
X. CELASTRACEAE			
14. *Perrottetia alpestris* (Bl.) Loes.	Dapuan siaw	/	
XI. CHLORANTHACEAE			
15. *Chloranthus elatior* R. Br. ex Link		/	/
16. *Sarcandra glabra*			/
XII. CLETHRACEAE			
17. *Clethra lancifolia* Turcz.	Sakam, Pamugisan nosa	/	/
XIII.CLUSIACEAE			
18. *Calophyllum blancoi* Pl. & Tr.	Bintangol, Palo maria	/	/
19. *Calophyllum lancifolium* Elm.	Pulayo		/
XIV.COMPOSITAE			
20. *Blumea bicolor* Merr.	Halib-on ihalas	/	/
XV. CORNACEAE			
21. *Mastixia premnoides* (Elm.) Hallier f.	Tagibokbok	/	/
XVI.CYPERACEAE			
22. *Carex* sp.1	Aglusay	/	

Table 10. Continued...

Family/Species	Local name	Distribution Plot 1	Plot 2
23. *Carex* sp.2	Pandasina	/	/
24. *Cyperus* sp.1	Limbas-limbas		/
25. *Cyperus* sp.2	Bugang		/
26. *Scleria scrobiculata* Ness & Mey. ex Ness	Limbas-limbas	/	
XVII. DIOSCOREACEAE			
27. *Dioscorea* sp.	Magulemon	/	
XVIII. ELAEOCARPACEAE			
28. *Elaeocarpus calomala* (Blco.) Merr.	Babate	/	/
XIX. ERICACEAE			
29. *Vaccinium jagori* Warb.	Lalumaw		/
XX. EUPHORBIACEAE			
30. *Glochidion album* (Blco.) Boerl.	Balitadhan, Libang na	/	/
31. *Glochidion canescens* Elm.	Tolog-tulog	/	
32. *Macaranga bicolor* Muell.-Arg.	Labulag	/	
33. *Macaranga dipterocarpifolia* Merr.	Salumay	/	/
34. *Sapium luzonicum* (Vid.) Merr.	Baho-baho	/	/
XXI. FAGACEAE			
35. *Lithocarpus mindanaensis* (Elm.) Rend.	Gulayan kaputos	/	/
36. *Lithocarpus ovalis* (Bl.) Rend.	Gulayan	/	/
37. *Lithocarpus philippinensis* (A.DC.) Rehd.	Kulasit kaputos	/	
38. *Lithocarpus sulitii* Soepadmo	Kulasit	/	
XXII. FLACOURTIACEAE			
39. *Flacourtia rukam* Zoll. & Mor.	Malakubi	/	/
XXIII. GRAMINEAE			
40. *Imperata cylindrica* (L.) P. Beauv.	Cogon		/
41. *Oplismenus* sp.	Lagitlit	/	/
42. *Paspalum conjugatum* Berg.	Lakatan	/	/
XXIV. GESNERIACEAE			
43. *Aeschynanthus* sp.	Christmas tree	/	
44. *Cyrtandra cumingii* C.B. Clarke	Lalago dako	/	/
45. *Cyrtandra parvifolia* Merr.	Pure salisip	/	/
46. *Cyrtandra* sp.	Tabako-tabako	/	
47. *Cyrtandra umbellifera* Merr.	Lalago pino		/
48. *Cyrtandra* sp.	Lumboy-lumboy		/
49. *Dichrotricum chorisepalum* C.B. Clarke	Unknown	/	/
50. *Trichosporum* sp.	Talipaso	/	/
XXV. HYDRANGEACEAE			
51. *Hydrangea chinensis* Maxim.	Salisip	/	
XXVI. HYPOXIDACEAE			
52. *Molinaria capitulata* (Lour.) Herbert	Karot, Tujabang	/	
XXVII. LABIATAE			
53. Unidentified sp.	Bino-bino		/
XXVIII. LAMIACEAE			
54. *Coleus* sp.	Mayana	/	

Table 10. Continued...

Family/Species	Local name	Distribution Plot 1	Plot 2
XXIX. LAURACEAE			
55. *Cinnamomum mercadoi* Vidal	Kalingag	/	/
56. *Cinnamomum mindanaense* Elm.	Mana-mana	/	/
57. *Eusideroxylon zwageri* Teijsm. & Binn.	Magamatong, Gamong	/	/
58. *Neolitsea vidalii* Merr.	Kupong-kupong	/	/
59. Unidentified sp.	Tigbay-tigbay	/	
XXX. LEEACEAE			
60. *Leea guineensis* G. Don	Bintuko	/	
XXXI. LILIACEAE			
61. *Dianella caerulea* Sims	Limbas-limbas	/	/
XXXII. LOGANIACEAE			
62. *Fagraea ceilanica* Thunb.	Bulak humot	/	/
XXXIII. MAGNOLIACEAE			
63. *Elmerillia platyphylla* (Merr.) Noot.	Lagundi, Ngilo	/	/
64. *Talauma reticulata* Merr.	Bunot-bunot	/	/
XXXIV. MELASTOMATACEAE			
65. *Astrocalyx calycina* (Vid.) Merr.	Hantatungaw brown	/	/
66. *Astronia cumingiana* Vid.	Tungaw-tungaw gagmay	/	
67. *Everettia pulcherrima* Merr.	Tungaw-tungaw puti	/	/
68. *Melastoma malabathricum* L.	Pure tutungaw		/
69. *Memecylon ovatum* Sm.	Balikuku, pulayo	/	/
70. *Medinilla clementis* Merr.	Kayupo lagwis	/	/
71. *Medinilla cumingii* Naud.	Kayupo	/	/
72. *Memecylon lanceolatum* Blco.	Digeg		/
XXXV. MELIACEAE			
73. *Chisocheton pentandrus* (Blco.) Merr. subsp. *pentandrus*	Lingaw malabago		/
74. *Toona calantas* Merr. & Rolfe	Lago tulang	/	
XXXVI. MORACEAE			
75. *Ficus aurantiaca* Griff.	Unknown	/	
76. *Ficus binnendykii* Miq. var. *coriacea* Corner	Galang nunok		/
77. *Ficus botryocarpa* Miq. var. *botryocarpa*	Tatanak	/	/
78. *Ficus cardinalicarpa* Elm.	Kalangkaeng	/	
79. *Ficus irisana* Elm. var. *irisana*	Tatanak lagwis, Saginsil	/	/
80. *Ficus nota* (Blco.) Merr.	Busyong	/	/
81. *Ficus odorata* (Blco.) Merr.	Busyong gamay		/
82. *Ficus septica* Burm. f. var. *septica*	Lagnob	/	/
83. *Ficus variegata* Bl. var. *syncomoroides*	Sigawan liakpaw		/
XXXVII. MYRSINACEAE			
84. *Ardisia* sp.	Gulisan pula	/	/
85. *Ardisia* sp.	Danglas		/
86. *Rapanea avenis* (Bl.) Miq.	Gulisan puti	/	/
XXXVIII. MYRTACEAE			
87. *Decaspermum fruticosum* J.R. & G. Forst.	Olingon	/	/
88. *Decaspermum* sp.	Balikuku	/	
89. *Rhodomyrtus* sp.	Ligad		/
90. *Syzygium huchinsonii* (Merr.) Merr.	Zazan, Sagimsim	/	
91. *Syzygium simile* (Merr.) Merr.	Pulayo puti	/	/
92. *Syzygium* sp.	Pulayo pula	/	/

Table 10. Continued...

Family/Species	Local name	Distribution Plot 1	Plot 2
XXXIX. ORCHIDACEAE			
93. *Geodorum* sp.	Unknown	/	
94. *Goodyera* sp.	Dalamdam	/	
95. *Malaxis* sp.	Unknown		/
96. *Dendrobium* sp.	Salapid		/
97. *Dendrochilum* sp.	Ahos-ahos	/	
98. *Unidentified* sp.	Aglusay	/	
XL. PALMAE			
99. *Pinanga philippinensis* Becc.	Karupay pula	/	/
100. *Pinanga* sp.	Karupay green	/	
XLI. PANDANACEAE			
101. *Freycinetia negrosensis* Merr.	Baraas	/	/
XLII. PIPERACEAE			
102. *Piper retrofractum* Vahl.	Buyo-buyo	/	/
103. *Piper* sp.	Buyo-buyo, Gapinbakbak	/	
XLIII. POLYGALACEAE			
104. *Polygala* sp.	Batikulon sa manok	/	
XLIV. ROSACEAE			
105. *Prunus grisae* (C. Muell.) Kalkm.	Tanga-tanga	/	/
106. *Parinari corymbosa* (Bl.) Miq.	Santol-santol	/	/
107. *Rubus* sp.	Sampinit	/	/
XLV. RUBIACEAE			
108. *Tarenna* sp.	Malakape	/	/
109. *Gardenia longiflora* Vid.	Tamilok	/	
110. *Neonauclea media* (Havil.) Merr.	Tambabawod	/	
111. *Wendlandia williamsii* Merr.	Malatakwaw		/
112. *Lasianthus appressifolius* Simizu		/	/
113. *Psychotria diffusa* Merr.	Bagun	/	/
XLVI. RUTACEAE			
114. *Euodia confusa* Merr.	Bintuko	/	/
115. *Melicope monophylla* Merr.	Bintuko lagpad		/
XLVII. SAPINDACEAE			
116. *Pometia pinnata* J.R. & G. Forst.	Malagabo	/	/
117. *Pometia pinnata* J.R. & G. Forst. *forma repanda* Jacobs	Darungnay, Sesengan	/	/
XLVIII. SAURAUIACEAE			
118. *Saurauia elegans* (Choisy) F.-Vill.	Balangog dako	/	
119. *Saurauia fasciculiflora* Merr.	Balangog lagwis	/	/
120. *Saurauia glabrifolia* Merr.	Balangog balhibuon	/	
121. *Saurauia involucrata* Merr.	Balangog balhibuon	/	/
122. *Saurauia latibractea* Choisy	Balangog lagwis puti	/	
XLIX. SAXIFRAGACEAE			
123. *Polyosma philippinensis* Merr.	Babasa	/	/
124. *Dichroa philipinnensis* Schltr.			
L. SMILACACEAE			
125. *Smilax* sp.	Banag	/	

Table 10. Continued...

Family/Species	Local name	Distribution Plot 1	Plot 2
LI. SOLANACEAE			
126. *Solanum torvum* Sev.	Gabol		/
LII. SYMPLOCACEAE			
127. *Symplocos villarii* Vid.	Lanutan	/	
128. *Symplocos* sp.	Highblood-highblood	/	/
LIII. THEACEAE			
129. *Adinandra montana* Merr.	Tabantis		/
130. *Adinandra robinsonii* Elm.	Tagilumboy	/	
131. *Adinandra* sp.	Tabantis lahi		/
132. *Eurya acuminata* DC.	Magatambis, Tabantis	/	/
133. *Gordonia luzonica* Vid.	Sabon-sabon	/	/
134. *Ternstroemia megacarpa* Merr.	Tagilumboy	/	/
135. *Pyrenaria mindanaensis* Merr.	Unknown		/
LIV. ULMACEAE			
136. *Trema orientalis* (L.) Bl.	Hanagdong	/	/
LV. URTICACEAE			
137. *Dendrocnide densiflora* (C.B. Rob) Chew	Lingatong	/	/
138. *Pilea melastomoides* (Poir.) Wedd.	Handalamay	/	
139. *Elatostema pulchellum* C.B. Rob.	Unknown	/	
140. *Elatostema* sp.	Unknown		/
141. *Pilea* sp.	Lamay-lamay	/	/
LVI. VERBENACEAE			
142. *Callicarpa erioclona* Sch.	Ngiyop	/	/
143. *Clerodendron macrostegium* Schauer	Lindang-lindang	/	
144. *Gratophyllum hortense* Nees	Atay-atay	/	
LVII. VITACEAE			
145. *Cayratia trifolia* (L.) Domin.	Palia-palia	/	
146. *Cayratia trifolia* (L.) Domin. var. *cinerea* (Lam.) Gagnep.	Lagili	/	
LVIII. ZINGIBERACEAE			
147. *Alpinia* sp.	Saging-saging		/
148. *Zingiber* sp.	Luy-a luy-a	/	/
LIX. UNIDENTIFIED SPECIES			
149. Unidentified sp.1	Ananagon	/	/
150. Unidentified sp.2	Kauban sa babasa	/	
151. Unidentified sp.3	Babasa lahi		/
152. Unidentified sp.4	Lalumaw, lumaw	/	
153. Unidentified sp.5	Magamatong lagwis	/	
154. Unidentified sp.6	Mangga-mangga	/	/
155. Unidentified sp.7	Nangka-nangka		/
156. Unidentified sp.8	Ngilo-ngilo, Sungay-Sungay	/	/
157. Unidentified sp.9	Tagibokbok lagpad	/	
158. Unidentified sp.10	Tambal hubag	/	
159. Unidentified sp.11	Tulan manok	/	/
160. Unidentified sp.12	Unidentified sp.1		/
161. Unidentified sp.13	Unidentified sp.2		/
162. Unidentified sp.14	Tagimahon	/	/
163. Unidentified sp.15	Darikpal, sinda-sinda	/	

Table 10. Continued...

Family/Species	Local name	Distribution Plot 1	Plot 2
164. Unidentified sp.16	Sibaon's limokon	/	/
165. Unidentified sp.17	Tambok-tambok	/	
166. Unidentified sp.18	Violet vine	/	/
167. Unidentified sp.19	Unknown 164	/	
TOTAL		**132**	**115**
B. GYMNOSPERMS			
I. Araucariaceae			
1. *Agathis philippinensis* Warb.	Almasiga	/	
II. Podocarpaceae			
2. *Dacrycarpus cumingii* (Parl.) de Laubenf.	Pine tree	/	/
3. *Dacrydium elatum* (Roxb.) Wall.	Lumot		/
4. *Phyllocladus hypophyllus* Hook. f.	Magaringan		/
5. *Podocarpus neriifolius* D. Don ex Lamb.	Subing diwata	/	
TOTAL		**3**	**3**
C. PTERIDOPHYTES			
I. Aspleniaceae			
1. *Asplenium crinicaule* Hance	Lakno, Grame	/	
2. *Asplenium decorum* Kunze			/
3. *Asplenium excisum* Presl			/
4. *Asplenium militare* Copel			/
5. *Asplenium phyllitidis* Don			/
II. Athyriaceae			
6. *Diplaziopsis javanica* (Bl.) Christen.	Butitay		/
7. *Diplazium tenuifolium* (Copel.) Price			
8. *Diplazium* sp.			
9. *Diplazium esculentum* (Retz.) Sw.			
10. *Diplazium* sp.			
III. Cyatheaceae			
11. *Cyathea contaminans* (Wall.) Copel.	Gantaw puti	/	/
12. *Cyathea* sp.	Gantaw brown	/	/
IV. Davalliaceae			
13. *Araiostegia hymenophylloides* (Bl.) Copel.		/	/
14. *Leucostegia immersa* (Wall.) Presl.	Kasikad, Lakno		/
15. *Humata obtusata* v.A.v.R.	Serelak	/	/
V. Dennstaedtiaceae			
16. *Microlepia trichosticha* J. Sm.			
VI. Dicksoniaceae			
17. *Cibotium cumingii* Kunze	Gantaw balhibuon		/
VII. Dryopteridaceae			
18. *Arachnioides amabilis* (Bl.) Tindale		/	
19. *Arachnioides aristata* (Forst.) Tindale		/	
20. *Arachnioides* sp.	Lakno		/
21. *Dryopteris sparsa* (Don) O. Kuntze		/	
22. *Polystichum elmeri* Copel.			/

Table 10. Continued...

Family/Species	Local name	Distribution Plot 1	Distribution Plot 2
VIII. Gleicheniaceae			
23. *Gleichenia truncata* (Willd.) Spreng.	Gaksam		/
IX. Grammitidaceae			
24. *Ctenopteris blechnoides* (Grev.) Wagner et Grether	Lakno	/	/
X. Hymenophyllaceae			
25. *Hymenophyllum* sp.	Bangnay, Lakno		/
26. *Hymenophyllum crispatum* Wall.	Lakno		/
27. *Hymenophyllum emarginatum* Sw.	Lakno		/
28. *Hymenophyllum polyanthus* Sw.	Lakno		/
29. *Trichomanes setaceum* v.d.B.	Lakno	/	
XI. Lindsaeaceae			
30. *Tapeinidium lineare* (Cav.) Christ		/	/
31. *Lindsaea adiatoides* J. Sm.			/
32. *Lindsaea* sp.			/
XII. Lomariopsidaceae			
33. *Elaphoglossum petiolatum* (Sw.) Urb.			/
XIII. Lycopodiaceae			
34. *Lycopodium serratum* Thunb.		/	
35. *Lycopodium verticillatum* Linn. f.			/
XIV. Marratiaceae			
36. *Marratia pellucida* Presl	Magalaglab, unod-unod		
XV. Oleandraceae			
37. *Oleandra nitida* (Copel.) Copel.	Kaliskis halas		/
XVI. Plagiogyriaceae			
38. *Plagiogyria pycnophylla* (Kunze) Mett.	Butitay	/	/
XVII. Polypodiaceae			
39. *Crypsinus trilobus* (Holtt.) Copel.		/	
40. *Crypsinus* sp.	Palad notong		/
41. *Goniophlebium argutum* Wall.		/	/
42. *Goniophlebium percussum* (Cav.) Wag. et Greth.			/
XVIII. Psilotaceae*			
43. *Tmesipteris lanceolata* Dang.		/	/
XIX. Pteridaceae			
44. *Pteris longipinnula* Wall. ex Agardh		/	
45. *Pteris tripartita* Sw.	Lakno, Palang-palang		/
46. *Pteris whitfordii* Copel.			/
XX. Sellaginellaceae			
47. *Selaginella biformis* A.Br. ex Kuhn	Bangnay		/
48. *Selaginella ciliaris* (Retz.) Spring.	Bangnay		/
49. *Selaginella involvens* (Sw.) Spr.	Bangnay	/	/
50. *Selaginella remotifolia* Spring	Bangnay		/
51. *Selaginella* sp.1	Bangnay		/
52. *Selaginella* sp.2	Bangnay		/

Table 10. Continued...

Family/Species	Local name	Distribution Plot 1	Plot 2
XXI. Thelypteridaceae			
53. *Chingia christii* (Copel.) Holtt.		/	
54. *Christella parasitica* (Linn.) Lev.		/	
55. *Coryphoteris* sp.			/
56. *Pneumatopteris costata* (Brack.) Holtt.		/	/
XXII. Vittariaceae			
57. *Vittaria elongata* Sw.			/
TOTAL		**23**	**47**
D. LICHENS			
I. Lobariaceae			
1. *Lobaria robinsonii*	Lumot	/	
2. *Lobaria* sp.	Lumot		/
3. *Pseudocyphellaria* sp.	Lumot	/	
4. *Sticta* sp.1 - hairy	Lumot	/	/
5. *Sticta* sp.2 - slimy	Lumot	/	/
II. Parmeliaceae			
6. *Parmotrema* sp.	Lumot	/	
III. Peltigeraceae			
7. *Peltigera* sp.	Lumot	/	
IV. Usneaceae			
8. *Usnea misamisensis* Vain	Lumot	/	
V. Unidentified			
9. Unidentified sp.	Ap-ap	/	
10. Unidentified sp.	Lichenized alga		/
11. Unidentified sp.	Unknown	/	
TOTAL		**9**	**4**
E. FUNGI			
I.			
1. *Xylaria hypoxylon*	Oten-oten sa unggoy	/	
II.			
2. *Stereum* sp.	Talingang batang	/	
TOTAL		**2**	**0**
F. BRYOPHYTES			
I. Anthocerotae			
1. *Anthoceros* sp.	Lumot		/
II. Bryaceae			
2. *Rhodobryum giganteum*	Lumot		/
III. Calymperaceae			
3. *Calymperes* sp.	Lumot	/	/
IV. Dicranaceae			
4. *Dicranoloma* sp.	Lumot	/	/
5. *Leucoloma* sp.	Lumot		/

Table 10. Continued...

Family/Species	Local name	Distribution Plot 1	Plot 2
V. Fissidentaceae			
6. *Fissidens* sp.1	Lumot	/	/
7. *Fissidens* sp.2	Bambol pisoy		/
VI. Hookeriaceae			
8. *Distichophyllum mittenii*	Lumot		/
9. *Distichophyllum nigricaule*	Lumot		/
VII. Hypnaceae			
10. *Ectropothecium* sp.	Lumot	/	/
VIII. Hypnodendraceae			
11. *Hypnodendron* sp.1	Tree moss	/	/
12. *Hypnodendron* sp.2 - One lane	Tree moss		/
13. *Hypnodendron dendroides*	Tree moss	/	/
IX. Hypopterygiaceae			
14. *Lopidium* sp.	Lumot	/	
X. Lejeuneaceae			
15. *Lejeunea* sp.	Lumot	/	
XI. Lepidoziaceae			
16. *Bazzania* sp.1	Lumot	/	/
17. *Bazzania* sp.2	Lumot		/
XII. Leucobryaceae			
18. *Leucobryum* sp.	Lumot puti	/	/
19. *Leucobryum javense*	Lumot puti		/
XIII. Marchantiaceae			
20. *Dumortiera* sp.	Lumot	/	
21. *Marchantia* sp.	Lumot	/	
XIV. Meteoriaceae			
22. *Aerobryidium* sp.	Lumot	/	
23. *Barbella* sp.	Lumot		/
24. *Barbella* sp.	Lumot	/	
25. *Meteorium* sp.	Lumot	/	/
26. *Floribundaria* sp.	Lumot	/	/
XV. Neckeraceae			
27. *Homaliodendron flabellatum*	Lumot	/	/
28. *Neckera warburgii*	Lumot		/
XVI. Plagiochilaceae			
29. *Plagiochila* sp.1	Lumot	/	/
30. *Plagiochila* sp.2	Lumot	/	/
31. *Plagiochila* sp.3	Lumot	/	/
32. *Plagiochila* sp.4	Lumot	/	/
33. *Plagiochila* sp.5	Lumot		/
34. *Plagiochila* sp.6	Lumot		/
XVII. Polytrichaceae			
35. *Pogonatum* sp.	Lumot	/	

Table 10. Continued...

Family/Species	Local name	Distribution Plot 1	Plot 2
XVIII. Pterobryaceae			
36. *Garovaglia elegans*	Lumot		/
XIX. Pterobryaceae			
37. *Calyptothecium* sp.	Lumot	/	
38. *Pterobryella longifrons*	Lumot		/
XX. Ptilidiaceae			
39. *Trichocolea* sp.	Lumot	/	/
XXI. Racopilaceae			
40. *Racopilum* sp.	Lumot	/	/
XXII. Rhizogoniaceae			
41. *Pyrrobryum latifolium*	Lumot	/	/
42. *Rhizogonium* sp.	Lumot	/	
XXIII. Riccardiaceae			
43. *Riccardia* sp.	Lumot		/
XXIV. Schistochilaceae			
44. *Schistochila* sp.1	Lumot		/
45. *Schistochila* sp.2	Lumot		/
46. *Schistochila* sp.3	Lumot		/
XXV. Sematophyllaceae			
47. *Trismegistia* sp.	Lumot	/	/
48. *Acroporium* sp.	Lumot	/	
XXVI. Spiridentaceae			
49. *Spiridens reinwardtii*	Lumot	/	/
XXVII. Thuidiaceae			
50. *Thuidium cymbifolium*	Feather moss	/	/
XXVIII. Unidentified species			
51. Unidentified sp.1	Lumot		/
52. Unidentified sp.2	Lumot		
53. Unidentified sp.3	Lumot		/
54. Unidentified sp.4	Lumot		
55. Unidentified sp.5	Lumot	/	
56. Unidentified sp.6	Lumot	/	
57. Unidentified sp.7	Lumot	/	/
58. Unidentified sp.8	Lumot	/	/
59. Unidentified sp.9	Lumot	/	/
60. Unidentified sp.10	Lumot		/
61. Unidentified sp.11	Lumot		/
TOTAL		**35**	**47**

Table 11. Species richness of trees* in two 1-ha plots in Malindang Range.

Family/Species	Local name	Official name	Mt. Ginanlajan	Palo 6	Endemic
Aceraceae					
1 *Acer laurinum* Hassk	Salindata			/	
2 *Gratophyllum hortense* Nees	Atayatay	Atay atay	/		
Anacardiaceae					
3 *Dracontomelon edule* (Blanco) *Skeels*	Byalong	Lamio	/	/	/
Araliaceae					
4 *Aralia bipinnata* Blanco	Suha-suha			/	/
5 *Schefflera* sp.					
Arecaceae					
6 *Pinanga philippinensis Becc.*	Karupay		/	/	/
7 *Calamus ornatus* Blume ex. Schultes	Oway	Oway		/	/
8 *Calamus usitatus* Blanco	Oway	Oway	/		
Bignoniaceae					
9 *Rhadermachera whitfordii* Merr.	Magasili			/	/
Burseraceae					
10 *Canarium hirsutum* var. *hirsutum* Willd.	Manog	Dulit	/		
Clethraceae					
11 *Clethra lancifolia* Turez	Sakam	Kamog	/	/	/
Clusiaceae					
12 *Callophyllum blancoi* Pl. & Tr.	Bitanghol	Bitanghol	/	/	/
13 *Calophyllum lancifolium* Elm.	Pulayo	Bitanghol sibat	/		/
Cornaceae					
14 *Mastixia premnoides* (Elm) Hallier f.	Magatalo		/	/	/
Cyatheaceae					
15 *Cyathea brevipes*	Gantaw	Tree fern	/	/	
Elaeocarpaceae					
16 *Elaeocarpus calomala* (Blanco) Merr.	Babate	Calomala	/	/	/
Euphorbiaceae					
17 *Glochidion album* (Blanco) Boerl	Libangna	Malabagang	/	/	/
18 *Macaranga dipterocarpifolia* Merr.	Salumay		/	/	
19 *Sapium luzonicum* (Vid.) Merr.	Baho-baho	Balakat gubat	/	/	/
Fagaceae					
20 *Lithcarpus sulitii* Soep.	Gulayan	Pangnan	/	/	/
21 *Lithocarpus mindanaensis* (Elmer) Rend.	Gulayan	Mindanao oak	/	/	/
22 *Lithocarpus philippinensis* (A.DC.) Rend.	Gulayan puti	Pangnan bundok	/	/	/
23 *Lithocarpus ovalis* (Blanco) Rend.	Gapotos	Maggasiriki	/		/
Flacourtiaceae					
24 *Flacourtia rukam* Zoll. & Mor.	Malakobe	Bitongol	/	/	
Hydrangeaceae					
25 *Hydragea chinensis* Maxim	Salisip		/		
Lauraceae					
26 *Cinnamomum mindanensae* Elmer			/		/
27 *Cinnamomum mercadoi* Vidal	Kalingag	Kaligag	/	/	/
28 *Eusideroxylon zwageri* Teijsm. and Binn.	Gamong	Tambulian	/	/	
29 *Neolitsea vidalii* Merr.	Magamatong	Puso-puso	/		/
Leeaceae					
30 *Leea guineensis* G. Don	Bintuko	Malimali	/		
Magnoliaceae					
31 *Talauma reticulata* Merr.	Bunot-bunot	Tabhisan	/	/	/
32 *Elmerillia platyphylla* (Merr.) Noot	Lagundi	Hangilo	/		/

Table 11. Continued...

Family/Species	Local name	Official name	Mt. Ginanlajan	Palo 6	Endemic
Melastomataceae					
33 *Astrocalyx calycina* (Vidal) Merr.	Hantutungaw	Tanghaw	/	/	/
34 *Astronia cumingiana* var. *cumingiana* Vidal	Tungaw-Tungaw	Badling	/	/	/
35 *Everettia pulcherima* Merr.	Tutungaw	Malintungaw	/	/	/
36 *Memecylon caeruleum* Jack	Balikoko	Javanes kulis		/	
Meliaceae					
37 *Chisocheton pentandrus* ssp. *Pentandrus* (Bl) Merr.	Lingaw malabago	Katong matsing	/	/	/
38 *Toona calantas* Merr. & Rolfe	Lago tulang	Kalantas	/		/
Moraceae					
39 *Ficus odorata*	Busyong gagmay		/	/	
40 *Ficus botryocarpa* var. *botryocarpa* Mig.	Tatanak	Basikong	/	/	/
41 *Ficus septica* var. *septica* Burm. F.	Lagnob	Hauili	/	/	/
42 *Ficus irisina* var. *irisina* Elmer	Saginsil	Aplas	/		/
43 *Ficus nota* (Blanco) Merr.	Busyong	Tibig	/	/	/
44 *Ficus binnendykii* var. *coriacea* Crner	Kalangkaing	Baliting liitan	/		
Myrsinaceae					
45 *Ardisia* sp.	Papaga pula		/	/	
46 *Rapanea avenis* (Bl.) Mig.	Papapa		/	/	
Myrtaceae					
47 *Decaspermum fruticosum* Forst.	Ulingon	Patalsik		/	
48 *Decaspermum* sp.	Tago bahi		/		
49 *Rhodomyrtus* sp.	Ligad		/	/	
50 *Syzygium simile* (Merr.) Merr.	Pulayo puti	Panglomboien	/	/	/
51 *Syzygium* sp.	Polayo			/	
52 *Syzygium hutchinsonii* (Merr.)	Pulayo	Malatambis	/		/
Pandanaceae					
53 *Pandanus copelandii* Merr.	Pandan	Pandan	/		/
Podocarpaceae					
54 *Dacrycarpus cumingii* (Parl.) de Laub.	Pine tree	Igem	/	/	/
55 *Dacrydium elatum* (Roxb.) Wall.	Lomot	Lokinai		/	
56 *Phyllocladus hypophyllus* Hook. f.	Magaringan	Dalung	/	/	/
Rosaceae					
57 *Parinari corymbosa* (Blume) Mig.	Santol-santol		/	/	
58 *Prunus grisae* var. *grisae* (Blume) Kalkm.	Tanga	Lago	/	/	/
Rubiaceae					
59 *Wendlandia wiliamsii* Merr.	Malatakwaw			/	/
60 *Gardinia longiflora* Vid	Magatamilok	Balanigan	/		/
61 *Tarenna* sp.	Malakape		/	/	
Rutaceae					
62 *Evodia confusa* Merr.	Bintuko	Bugauak	/	/	
63 *Melicope monophylla* Merr.	Bintuko Dako	Dalo		/	/
Sapindaceae					
64 *Pometia pinnata forma repanda*	Sesengan	Malugai liitan		/	
65 *Pometia pinnata* Forst	Malabago	Malugai	/	/	/
Saurauiaceae					
66 *Saurauia latebractea* Merr.	Balangog			/	/
67 *Saurauia fasciculiflora* Merr.	Balangog lagwis			/	/
Saxifragaceae					
68 *Polyosma philippinensis* Merr.	Babasa		/	/	/

Table 11. Continued...

Family/Species	Local name	Official name	MT. Ginanlajan	Palo 6	Endemic
Symplocaceae					
69 *Symplocos* sp.	Highblood		/	/	
70 *Symplocos villarii* Vid	Lanutan	Agosip	/	/	/
Theaceae					
71 *Adinandra montana* Merr	Tabantis		/	/	/
72 *Gordonia luzonica* Vidal	Sabon-sabon		/	/	/
73 *Ternstroemia megacarpa* Merr.	Tagilumboy			/	/
Ulmaceae				/	
74 *Trema orientalis* (L.) Blume	Hanagdong	Anabiong	/		
Urticaceae					
75 *Dendrocnide densiflora* (C.B.Rob) *Chew*	Lingatong	Lipang kalabaw	/	/	/
Verbenaceae					
76 *Callicarpa eriocloma* Sch.	Ngiyop		/	/	
Unidentified					
77 Unidentified sp.1	Babasa lahi			/	
78 Unidentified sp.2	Banisil		/		
79 Unidentified sp.3	Lalumaw		/		
80 Unidentified sp.4	Manga-manga			/	
81 Unidentified sp.5	Morag tambis			/	
82 Unidentified sp.6	Patilo		/		
83 Unidentified sp.7	Tubo Tubo		/		
84 Unidentified sp.8	Tulanmanok		/	/	
85 Unidentified sp.9	Unidentified 265			/	
TOTAL			**67**	**63**	**48**

Table 12. Scientific groupings of species by family and genus with indigenous names.

Family/Genus	Indigenous names
ACANTHACEAE	
Justicia	Babakag
Gratophyllum	Atay-atay
ANACARDIACEAE	
Dracontomelon	Byalong, Magabyalong
ARALIACEAE	
Aralia	Suha-suha
Schefflera	Tagima
ARAUCARIACEAE	
Agathis	Almasiga, Dingan
ASPLENIACEAE	
Asplenium	Lakno, Grame
ATHYRIACEAE	
Diplaziopsis	Butitay
Diplazium	Pako
BALSAMINACEAE	
Impatiens	Silangka
BEGONIACEAE	
Begonia	Amamangpang, Mamangpang
BIGNONIACEAE	
Radermachera	Magasili
CHLORANTHACEAE	
Chloranthus	Babakag
Sarcandra	Babakag
CLETHRACEAE	
Clethra	Pamugisan nosa, Sakam
CLUSIACEAE	
Calophyllum	Bintangol, Palo maria
COMPOSITAE	
Blumea	Handilib-on, Halib-on
CORNACEAE	
Mastixia	Magatalo, Tagibokbok
CYATHEACEAE	
Cyathea	Gantaw
CYPERACEAE	
Cyperus	Bugang, Limbas-limbas
DICKSONICEAE	
Cibotium	Gantaw
DIOSCOREACEAE	
Dioscorea	Magulemon
ELAEOCARPACEAE	
Elaeocarpus	Babate, Tanga-tanga
ERICACEAE	
Vaccinium	Lalumaw, Lumaw
EUPHORBIACEAE	
Glochidion	Balitadhan, Libang na, Tulog-tulog
Macaranga	Labulag, Salumay
Sapium	Baho-baho
FAGACEAE	
Lithocarpus	Gulayan, Kulasit
FLACOURTIACEAE	
Flacourtia	Malakubi
GESNERIACEAE	
Aeschynanthus	Christmas tree
Cyrtandra	Lalago, Salisip, Tabako-tabako, Lumboy-lumboy
Trichosporum	Talipaso, Panosolan

Table 12. Continued...

Family/Genus	Indigenous Names
GRAMINEAE	
Imperata	Kogon
Oplismenus	Lagitlit
Paspalum	Lakatan
HYDRANGEACEAE	
Hydrangea	Salisip
HYPOXIDACEAE	
Molinaria	Karot
LAURACEAE	
Cinnamomum	Kalingag, Mana-mana
Eusideroxylon	Gamong, Magamatong
Neolitsea	Kupong-kupong, Magamatong
LEEACEAE	
Leea	Bintuko
LYCOPODIACEAE	
Lycopodium	Ikog sa iring
MAGNOLIACEAE	
Elmerilla	Lagundi, Ngilo
Talauma	Bunot-bunot, Salimbunot
MARRATIACEAE	
Marratia	Magalaglab, Unod-unod
MELASTOMATACEAE	
Astrocalyx	Hantatungaw
Astronia	Tungaw-tungaw
Everettia	Tungaw-tungaw
Medinilla	Kayupo
Melastoma	Tutungaw
Memecylon	Balikuku
MELIACEAE	
Chisocheton	Malabago
Toona	Lago tulang
MORACEAE	
Ficus	Busyong, Galang nunok, Labnog, Saginsil, Sigawan liakpaw, Tatanak
MYRSINACEAE	
Ardisia	Danglas, Gulisan
Rapanea	Gulisan
MYRTACEAE	
Decaspermum	Balikuku, Olingon
Rhodomyrtus	Ligad
Syzygium	Pulayo, Sagimsim, Zazan
ORCHIDACEAE	
Habenaria	Dalamdam
PALMAE/ARECACEAE	
Calamus	Uway
Pinanga	Karupay
PANDANACEAE	
Freycinetia	Baraas, Blas notong
Pandanus	Pandan
PIPERACEAE	
Piper	Buyo-buyo, Gapinbakbak
PODOCARPACEAE	
Dacrycarpus	Baburing, Pine tree
Dacrydium	Lumot
Phyllocladus	Magaringan, Tungog
Podocarpus	Subing diwata

Table 12. Continued...

Family/Genus	Indigenous names
PTERIDACEAE	
Pteris	Lakno, Palang-palang
ROSACEAE	
Parinari	Santol-santol
Prunus	Tanga-tanga
Rubus	Sampinit, Sabinit
RUBIACEAE	
Neonauclea	Labalod, Tambabawod
Wendlandia	Malatakwaw
RUTACEAE	
Euodia	Bintuko
Melicope	Bintuko
Tarenna	Malakape
SAPINDACEAE	
Pometia	Darungnay, Malabago, Sesengan
SAURAUIACEAE	
Saurauia	Balangog
SAXIFRAGACEAE	
Polyosma	Babasa
SELAGINELLACEAE	
Selaginella	Bangnay
SOLANACEAE	
Solanum	Gabol
SYMPLOCACEAE	
Symplocos	Highblood-highblood, Lanutan
THEACEAE	
Adinandra	Tabantis
Eurya	Magatambis, Tabantis
Gordonia	Sabon-sabon
Ternstroemia	Tagilumboy
ULMACEAE	
Trema	Hanagdong
URTICACEAE	
Dendrocnide	Lingatong
Pilea	Handalamay, Lamay-lamay
VERBENACEAE	
Callicarpa	Ngiyop
Clerodendron	Lindang-lindang
VITACEAE	
Cayratia	Palya-palya, Lagili
ZINGIBERACEAE	
Alpinia	Saging-saging
Zingiber	Luy-a luy-a
UNIDENTIFIED	
Unidentified	Ananagon, Cyrus
Unidentified	Darikpal, Sinda-sinda
Unidentified	Gasa
Unidentified	Kauban sa Babasa
Unidentified	Lumaw, Lalumaw
Unidentified	Magamatong
Unidentified	Mangga-mangga
Unidentified	Ngilo-ngilo, Sungay-sungay
Unidentified	Tagibokbok
Unidentified	Tambal hubag
Unidentified	Tambok-tambok
Unidentified	Tulan manok
Unknown	Unknown

Table 13. Summary of economically important plants.

Uses	Species (no.)
Food	14
Medicine	39
Ornamental	18
Sociocultural	10
Other Uses (lumber, firewood, handicraft)	100
Total	**181**

Table 14. Plant species in Mt. Malindang with medicinal uses assessed by the community.

Local name	Scientific name	Ailments that can be cured
1. Abaka	*Musa textilis* Nee	6
2. Abgaw		5
3. Abod		2
4. Abokado	*Persea americana*	11
5. Adyopana		1
6. Aglusay		1
7. Agutay		1
8. Agyo		1
9. Ahos	*Allium sativum* L.	3
10. Alagasi	*Leucosyke capitellata* (Poir.) Wedd.	5
11. Albutra, Magulemon	*Arcangelisia flava* (L.) Merr.	8
12. Alingatong	*Dendrocnide densiflora*	2
13. Almasiga	*Agathis philippinensis*	4
14. Alum		1
15. Amagos		1
16. Amorseko	*Chrysopogon aciculatus*	1
17. Ampiyon		1
18. Ananagon	Unidentified sp.	5
19. Ananamsi	*Eurya acuminata*	4
20. Anghelika	*Kalanchoe pinnata* (Lamk.) Pers.	8
21. Anonang		3
22. Antulanga	*Hibiscus rosa-sinensis* L.	6
23. Aslom		2
24. Asunting	*Cassia alata* L.	2
25. Bago	*Gnetum gnemon*	4
26. Bahay		1
27. Baho-baho	*Sapium luzonicum*	3
28. Bakaw		1
29. Balangog	*Saurauia involucrata*	2
30. Balangog lagwis	*Saurauia fasciculiflora*	3
31. Balite	*Ficus* sp.	3
32. Banaba	*Lagerstroemia speciosa* (L.) Pers.	1
33. Banag	*Smilax* sp.	2
34. Bangka-bangkahan		1
35. Bani		2
36. Banisil		1
37. Bansagan		1
38. Baras-baras		1
39. Baungon	*Citrus grandis* (L.) Osb.	7
40. Bayabas	*Psidium guajava* L.	12
41. Baylo-baylo		1
42. Bermuda	*Cynodon dactylon*	3
43. Bila	*Belamcanda chinensis*	2
44. Bila-bila	*Eleusine indica* (L.) Gaertn.	11
45. Bino-bino		1
46. Bintaus		1
47. Biti-biti, otot demonyo	*Lantana camara* L.	1
48. Bugayana		1
49. Bugsakan wasay	*Aphanamixis perrottetiana*	1
50. Buhok ni Maria	*Usnea* sp.	1
51. Buli	*Corypha utan*	7
52. Buliyantin		1
53. Bunga	*Areca catechu* L.	2
54. Bunod		2
55. Buntong	*Bambusa* sp.	1
56. Busikad	*Cyperus brevifolius*	8
57. Busyong	*Ficus odorata*	1
58. Buwagon		1
59. Buyo	*Piper retrofractum*	6

Table 14. Continued...

Local name	Scientific name	Ailments that can be cured
60. Byasong		1
61. Cobra		1
62. Comfrey	*Symphytum officinale*	5
63. Crinoso		1
64. Cyrus vine		1
65. Dalapaw, Dapaw-dapaw		2
66. Dama	*Cestrum nocturnum*	1
67. Darikpal		1
68. Dawa		2
69. Dila-dila	*Elephantopus scaber*	16
70. Diplawan		1
71. Domiro		1
72. Duldol	*Bombax ceiba*	1
73. Durian	*Durio zibethinus*	1
74. Elipante	*Stachytarpheta jamaicensis*	5
75. Eskobang mayawis	*Sida rhombifolia* L.	5
76. Espada-espada	*Sanseviera zeylanica* (L.) Wiild.	1
77. Gabi	*Colocasia esculentum*	3
78. Ganda		5
79. Gantaw	*Cyathea contaminans*	8
80. Gapas-gapas	*Crassocephalum crepidioides*	4
81. Gatas-gatas, Salingkapaw	*Euphorbia hirta*	1
82. Gilon	*Bischofia javanica*	7
83. Giwa		1
84. Gubo rubod		2
85. Hagnaya		1
86. Hagonoy	*Chromolaena odorata*	2
87. Hanagdong	*Trema orientalis*	8
88. Handalamay	*Pilea melastomoides*	2
89. Handalupang		2
90. Handalusa	*Justicia gendarussa*	10
91. Handaluyot		1
92. Handilib-on, Gabon	*Blumea balsamifera*	14
93. Hantulaya		1
94. Hantutungaw	*Melastoma malabathricum*	2
95. Haruy		1
96. Hibi-hibi	*Mimosa pudica* L.	1
97. Highblood-highblood	*Symplocos* sp.	1
98. Hilbas	*Artemisia vulgaris*	4
99. Himbabuena	*Mentha arvensis* L.	5
100. Humay	*Oryza sativa*	2
101. Ikog sa iring	*Lycopodium squarossum*	1
102. Inday-inday, Pikot-pikot, Baras-baras		8
103. Kadisnon	*Musa* sp.	2
104. Kaimito	*Chrysophyllum cainito* L.	4
105. Kakao	*Theobroma cacao* L.	5
106. Kalabasa	*Cucurbita maxima* Duchesne	2
107. Kalabo		5
108. Kalachuchi	*Plumiera acuminata*	2
109. Kalamantigue	*Impatiens balsamina*	4
110. Kalayaan, Gulian		2
111. Kalingag	*Cinnamomum mercadoi* Vidal	3
112. Kaliskis ahas	*Oleandra nitida*	1
113. Kalubi		1
114. Kamansilis	*Artocarpus* sp.	2
115. Kamote pula	*Ipomoea batatas* L.	2
116. Kamoteng kahoy	*Manihot esculenta*	4
117. Kamunggay	*Moringa oleifera*	1

Table 14. Continued...

Local name	Scientific name	Ailments that can be cured
118. Kanding-kanding		4
119. Kapayas	*Carica papaya* L.	8
120. Kape	*Coffea arabica*	2
121. Kardaba	*Musa* sp.	1
122. Karots	*Daucus carota* var. *sativa*	2
123. Kasla, Tuba-tuba	*Jatropha curcas* L.	7
124. Kilala		1
125. Kilob	*Gleichenia truncata*	1
126. Kogon	*Imperata cylindrica* (L.) Beauv.	5
127. Kolitis, kudyapa	*Amaranthus viridis* L.	2
128. Kukogbanog	*Elephantopus tomentosus* L.	8
129. Kumintang	*Catharanthus roseus* (L.) Reichb.	3
130. Kurawang, Alas kwatro	*Mirabilis jalapa*	1
131. Labana	*Annona muricata*	1
132. Labigan	*Acorus calamus* L.	1
133. Labnog	*Ficus septica* var. *septica*	10
134. Labulag	*Macaranga bicolor*	1
135. Laguloy		1
136. Lagundi	*Vitex negundo* L.	2
137. Lakatan	*Paspalum conjugatum*	1
138. Lalambo, Tambok-tambok	Unidentified sp.	2
139. Lalano		1
140. Lalawe		1
141. Lalumaw		2
142. Lambi		1
143. Lansona		1
144. Lansones	*Lansium domesticum*	1
145. Lanutan lahi		1
146. Latepo	*Medinilla cumingii*	2
147. Lawog		1
148. Lemonsito	*Citrus microcarpa* Bunge	4
149. Likway		1
150. Lindog		1
151. Lokos		2
152. Luang		2
153. Lubi	*Cocos nucifera*	7
154. Lubigan		1
155. Luhod-luhod		1
156. Lumbilan		2
157. Lumboy	*Syzygium cumini*	3
158. Lusay		1
159. Luy-a	*Zingiber officinale* Rosc.	11
160. Madre de cacao	*Cassia*	2
161. Mahogany	*Swietenia macrophylla*	1
162. Mais	*Zea maize*	7
163. Malabago	*Pometia pinnata*	1
164. Mamagos		1
165. Mamangpang	*Begonia cumingii*	1
166. Mangga	*Mangifera indica*	2
167. Mangosteen	*Mangostana montana*	3
168. Mani	*Arachis hypogaea* L.	1
169. Manog, kamanyan	*Canarium hirsutum* var. *hirsutum*	1
170. Maragaya		4
171. Marang	*Artocarpus odoratissimus*	1
172. Maribuhok	*Casuarina montana*	2
173. Marugo	*Iresine herbstii* Hook.	2
174. Mayana kuyanap		1
175. Mayana pula	*Coleus blumei*	9
176. Mayana puti	*Coleus* sp.	2

Table 14. Continued...

Local name	Scientific name	Ailments that can be cured
177. Monggos	*Vigna radiata*	2
178. Muti-muti	*Solanum nigrum* L.	1
179. Nangka	*Artocarpus heterophyllus* Lamk.	10
180. Narra	*Pterocarpus indicus*	1
181. Natumao		1
182. Nescape	*Cassia tora*	1
183. Ngilo	*Elmerillia platyphylla*	1
184. Ngiyop	*Callicarpa erioclona*	9
185. Niyob		1
186. Oway	*Calamus usitatus*	2
187. Pahauli		1
188. Palad tiki		1
189. Paling		1
190. Paliya	*Momordica charantia* L.	1
191. Palo maria	*Calophyllum blancoi*	2
192. Pampalan		1
193. Panyawan	*Tinospora rumphii* Boerl.	3
194. Patola	*Luffa acutangula*	2
195. Perioles	*Phaseolus lunatus*	2
196. Pikot-pikot		1
197. Pine tree	*Dacrycarpus cumingii*	1
198. Pinya	*Ananas comosus* (L.) Merr.	1
199. Pisaw-pisaw	*Emilia sonchifolia*	9
200. Pisngi ni inday		1
201. Progonium, covercrop		1
202. Pulayo, Bagtikan		5
203. Repolyo	*Brassica oleracea* var. *capitata*	1
204. Romlon	*Pandanus* sp.	1
205. Sabila	*Aloe barbadensis* Mill.	2
206. Sabinit	*Rubus* sp.	3
207. Saging	*Musa sapientum*	5
208. Saging bulungan	*Musa* sp.	4
209. Saging kadisnon	*Musa* sp.	1
210. Salapid		1
211. Salimbagat		1
212. Salisip	*Hydrangea chinensis*	1
213. Sanib, Bawing	*Ocimum basilicum* L.	10
214. Santo domingo		3
215. Santol	*Sandoricum koetjape*	3
216. Sayote	*Sechium edule*	2
217. Sibukaw	*Caesalpinia sappan* L.	4
218. Sibuyas	*Allium fistulosum* L.	3
219. Sili	*Capsicum frutescens* L.	4
220. Sinda-sinda - grass		2
221. Suha		1
222. Tabako	*Nicotiana tabacum*	8
223. Tabalse		1
224. Tagilayo		1
225. Tagima	*Schefflera odorata*	2
226. Tagubahi	*Decaspermum* sp.	1
227. Talong	*Solanum melongena*	1
228. Tambis	*Syzygium*	1
229. Tambon-tambon	*Atuna racemosa*	3
230. Tamilok	*Gardenia longiflora*	1
231. Tangan-tangan	*Ricinus communis*	1
232. Tangkuluran		1
233. Tanglad	*Cymbopogon citratus*	9
234. Tanguile	*Shorea polysperma*	1
235. Tiwase	*Costus speciosus*	4

Table 14. Continued...

Local name	Scientific name	Ailments that can be cured
236. Tubo	*Saccharum officinarum*	2
237. Tubo-tubo		1
238. Tulay-tulay	*Bidens pilosa*	6
239. Tundan	*Musa* sp.	3
240. Tungaw-tungaw	*Melastoma malabathricum*	1
241. Ubod		1
242. Ungkog		1
243. Upo	*Lagenaria siceraria*	1
244. Uway	*Calamus usiatus*	1
245. Yahong-yahong	*Centella asiatica* L.	1
246. Unknown	*Cordyline fruticosa* (L.) A. Cheval	1
247. Unknown	*Hyptis capitata*	1

Table 15. List of ailments in Mt. Malindang and herbal species used as cure.

	Ailments	Herbal plant species used to cure
1	Abscess on gums	2
2	Amoeba	9
3	Anemia	7
4	Anti-sterility	2
5	Arthritis	8
6	Asthma	2
7	Beri-beri	2
8	Insect bites	1
9	Boils	26
10	Cholera	15
11	Clogged nose	3
12	Contusion	2
13	Cough	30
14	Diabetes	1
15	Dog bite	7
16	Dysmenorrhea	4
17	Eczema	2
18	Edema	10
19	Eltor	6
20	Fever	59
21	Flatulence	8
22	After childbirth	3
23	Goiter	6
24	Good eyesight	3
25	Hairloss	3
26	Headache	34
27	Heart ailment	4
28	Hematemesis	4
29	Hepatitis	5
30	Hypertension	5
31	Indigestion	6
32	Internal fever	2
33	Influenza	2
34	Kidney trouble	15
35	Late menstruation	2
36	LBM	25
37	Leukemia	1
38	Measles	12
39	Migraine	1
40	Miscarriage	1
41	Mouth sores	2
42	Mumps	18
43	Muscle pains	1
44	Nosebleeding	2
45	Otitis media	6
46	Paleness	2
47	Poisoning	3
48	Pulmonia	2
49	Relapse	33
50	Rheumatism	6
51	Colds	12
52	Skin allergy	2
53	Skin diseases	4
54	Skin infection (Kaskaro, Kurikong, Bun-I)	6
55	Skin itching (Dupang)	6
56	Skin sores (Ugahip)	4
57	Snakebite	4
58	Sore eyes	2
59	Sore throat	3
60	Sprains	10
61	Stomachache/Gastric pains	33
62	Tonsilitis	2
63	Toothache	1
64	Tuberculosis	2
65	Ulcer	12
66	Waist pains	5
67	Whooping cough	1
68	Wounds	36
69	Thirst	1
70	Anthelminthic	1
71	Tetanus	1
72	Typhoid fever	1
73	Hemorrhage	1
74	“Gangipunan”	9
75	“Kabuhi”	17
76	“Dagaton”	1
77	“Luod”	1
78	“Nuka-nuka”	5
79	“Pasmo”	38
80	“Sakit sa kuto-kuto”	25
81	“Sinda”	7
81	“Sinda sa hangin”	5
82	“Utol”	3
83	“Bago”	1
84	“Tunok sa lansang”	6
85	“Impatsu”	1
86	“Lamon”	1
87	To increase mother’s milk	1

Table 16. Plant species in Mt. Malindang considered as food plants.

Local name	Scientific name	F	V	S	ER	Total
1. Agutay	*Musa* sp.	/				1
2. Almasiga	*Agathis philippinensis*	/				1
3. Ananagon		/				1
4. Anibong			/			1
5. Aslom		/				1
6. Bago	*Gnetum gnemon*		/			1
7. Balangas		/				1
8. Balangog	*Saurauia involucrata*	/				1
9. Balite	*Ficus* sp.		/			1
10. Balobo		/				1
11. Balugisan		/				1
12. Batiles				/		1
13. Dao	*Dracontomelon dao*	/				1
14. Dupol		/				1
15. Passion fruit	*Passiflora edulis*	/				1
16. Gabi-gabi			/			1
17. Ganlis		/				1
18. Gantaw	*Cyathea contaminans*		/			1
19. Garang		/				1
20. Gasa		/				1
21. Gilon	*Bischofia javanica*	/		/		1
22. Gulayan kaputos	*Lithocarpus mindanaensis*	/				1
23. Gurong		/				1
24. Hagnaya			/			1
25. Hantutungaw	*Melastoma malabathricum*	/				1
26. Harag		/				1
27. Kalubi		/				1
28. Kamagi				/		1
29. Kamansiles	*Artocarpus* sp.	/				1
30. Kandiis		/				1
31. Karot, Tuyabang	*Molinaria capitulata*	/				1
32. Karupay	*Pinanga philippinensis*		/			1
33. Katmon, lambug	*Dillenia philippinensis*	/				1
34. Katuron		/				1
35. Kubong/Nami	*Dioscorea hispida*	/	/			1
36. Kurirol	*Rubus rosaefolius*	/				1
37. Lalumaw		/			/	2
38. Latepo	*Medinilla cumingii*	/				1
39. Lokdo-lokdo	*Diplazium* sp.		/			1
40. Luyaw		/				1
41. Malibatwan		/				1
42. Malibagon		/			/	2
43. Mamampang	*Begonia cumingii*	/			/	2
44. Mamata		/				1
45. Mangga-mangga		/				1
46. Mangganotong		/				1
47. Manla		/			/	2
48. Mote	*Solanum nigrum*		/			1
49. Natu/Lukos-lukos		/				1
50. Nito	*Lygodium circinatum*		/			1
51. Nupol		/	/			2
52. Pakit			/			1
53. Pako-pako	*Diplazium esculentum*	/	/			2
54. Palali		/				1
55. Paling		/				1
56. Palikan			/			1
57. Pamasitan		/				1

Table 16. Continued...

Local name	Scientific name	F	V	S	ER	Total
58. Pangi		/				1
59. Petsay-petsay			/			1
60. Pugahan	*Caryota rumphii*		/		/	2
61. Pulayo		/				1
62. Pusaw		/	/			2
63. Sabinit	*Rubus* sp.	/				1
64. Salawag			/			1
65. Salimbago		/				1
66. Salung-gisog				/		1
67. Siryalis		/				1
68. Suha		/		/		2
69. Tabige			/			1
70. Talan		/				1
71. Tambis-tambis		/				1
72. Tambok-tambok/Lalambo		/	/			2
73. Tarbak	*Zingiber* sp.	/	/			2
74. Timbangalan			/			1
75. Tulay-tulay			/			1
76. Ubas		/				1
77. Ungkog					/	1
78. Urong		/				1
79. Uway	*Calamus usitatus*	/	/			2
TOTAL		**57**	**25**	**5**	**6**	

Legend:
F - Fruit
V - Vegetable
S - Spice
ER - Eaten raw

Table 17. Economically-important species in Mt. Malindang as assessed by the community.

Local name	Scientific name	HC	O	H	F	OU	IN	Total
1. Abaka	*Musa textilis*			/		/		2
2. African daisy	*Gerbera jamesonii*		/					1
3. Albotra	*Arcangelisia flava* (L.) Merr.					/		1
4. Alingatong	*Dendrocnide densiflora*				/			1
5. Almasiga, Cedar	*Agathis philippinensis*	/			/			2
6. Anthurium	*Anthurium andraeanum*		/					1
7. Antuanga	*Hibiscus rosa-sinensis*		/					1
8. Apitong	*Dipterocarpus grandiflorus*	/						1
9. Bakhaw		/						1
10. Balabaan		/						1
11. Balingbing sa kagulangan			/					1
12. Balitadhan	*Glochidion album*	/						1
13. Balite	*Ficus* sp.				/			1
14. Balungbong		/		/				2
15. Banban	*Donax cannaeformis*			/		/		2
16. Baraas	*Freycinetia negrosensis*			/				1
17. Batang-batang						/		1
18. Bayanti					/			1
19. Binalati	*Calamus usitatus*			/		/		2
20. Bintuko	*Euodia confusa*	/						1
21. Blas						/		1
22. Bombil	*Bougainvillea spectabilis*		/					1
23. Bubingan			/					1
24. Bugsakan wasay	*Aphanamixis perrottetiana*				/			1
25. Bulak sa kagulangan (Orchids)			/					1
26. Buli	*Corypha utan*					/		1
27. Bulitik, White lauan	*Shorea contorta*				/			1
28. Bunot-bunot	*Talauma reticulata*	/			/			2
29. Butterfly plant			/					1
30. Dahlia	*Dahlia* sp.		/					1
31. Dapo-antigbay					/			1
32. Dancing lady			/					1
33. Danlugan		/			/			2
34. Daula						/		1
35. Dingan	*Almaciga philippinensis*	/			/			2
36. Duranta	*Duranta repens* "Golden"		/					1
37. Falcata	*Paraserianthes falcataria*				/			1
38. Gabi-gabi	*Colocasia bicolor*		/					1
39. Ganon		/						1
40. Gantaw	*Cyathea contaminans*				/			1
41. Gasog-lemon-vine						/		1
42. Gasuso		/			/			2
43. Gilon	*Bischofia javanica*	/			/			2
44. Giyong				/				1
45. Guban					/			1
46. Gulayan	*Lithocarpus ovalis*	/			/			2
47. Everlasting	*Helichrysum bracteatum*		/					1
48. Hagnaya				/		/		2
49. Hanagdong	*Trema orientalis*	/			/			2
50. Handilika	*Kalanchoe pinnata*		/					1
51. Hindang		/						1
52. Ikog sa iring, Tagawili	*Lycopodium squarossum*		/					1
53. Jakarta			/					1
54. Kadena de amor			/					1
55. Kalayaan		/						1
56. Kalingag	*Cinnamomum mercadoi*	/						1

Table 17. Continued...

Local name	Scientific name	HC	O	H	F	OU	IN	Total
57. Kapa de leon			/					1
58. Karupay	*Pinanga philippinensis*		/					1
59. Katigbe				/				1
60. Katmon	*Dillenia philippinensis*	/						1
61. Kawayan	*Bambusa* sp.	/	/					2
62. Kabkab	*Asplenium nidus*		/					1
63. Kogon	*Imperata cylindrica*	/						1
64. Kulasit	*Lithocarpus sulitii*				/			1
65. Labigan			/					1
66. Labulag	*Macaranga bicolor*				/			1
67. Lagili	*Cayratia trifolia* var. *cinerea*					/		1
68. Lago-tulang	*Toona calantas*				/			1
69. Lagundi	*Elmerillia platyphylla*	/			/			2
70. Laknap				/				1
71. Latigo nga dalang			/					1
72. Lawaan pula	*Shorea negrosensis*	/						1
73. Lawaan puti	*Shorea contorta*	/						1
74. Limbas-limbas	*Cyperus* sp.					/		1
75. Lipata		/						1
76. Lipatong				/				1
77. Lirio	*Hippeastrum puniceum*		/					1
78. Lubi	*Cocos nucifera*			/				1
79. Lokinai	*Dacrydium elatum*	/	/					2
80. Lokos		/						1
81. Magamatong	*Eusideroxylon zwageri*	/			/			2
82. Magaringan	*Phylocladus hypophyllus*	/			/	/		3
83. Magsinolo		/						1
84. Mahogany	*Swietenia mahogany*	/						1
85. Mais-mais			/					1
86. Malabago	*Pometia pinnata*	/						1
87. Malakauayan	*Podocarpus philippinensis*	/						1
88. Mamangpang	*Begonia cumingii*		/					1
89. Maribuhok	*Casuarina montana*	/	/		/			3
90. Mayana	*Coleus blumei*		/					1
91. Million			/					1
92. Nap-nap				/				1
93. Nato		/						1
94. Nito	*Lygodium circinatum*			/		/		2
95. Nupol						/		1
96. Pagaypay						/		1
97. Paling						/		1
98. Palo maria	*Calophyllum blancoi*	/						1
99. Pandan	*Pandanus multiflora*					/		1
100. Pine tree	*Dacrycarpus cumingii*	/	/					2
101. Pitcher plant	*Nepenthes* sp.		/					1
102. Pudlos	*Calamus ornatus*			/		/		2
103. Pulayo		/			/			2
104. Romblon	*Pandanus* sp.					/		1
105. Rosal	*Gardenia jasminoides*		/					1
106. Rose	*Rosa grandiflora*		/					1
107. Sabon-sabon	*Gordonia luzonica*	/						1
108. Sagimsim	*Adinandra robinsonii*	/						1
109. Saging-saging	*Alpinia* sp.		/					1
110. Saksak		/				/		2
111. Sakam	*Clethra lancifolia*				/			1
112. Salindata	*Acer laurinum*				/			1
113. Silangka	*Impatiens montalbanica*		/					1
114. Subing diwata	*Podocarpus neriifolius*	/			/			2
115. Salumay	*Macaranga dipterocarpifolia*				/			1

Table 17. Continued...

Local name	Scientific name	HC	O	H	F	OU	IN	Total
116. Tagawili		/						1
117. Tagat-nolang				/				1
118. Tagibokbok	*Maastixia premnoides*	/						1
119. Tagilumboy	*Ternstroemia megacarpa*	/						1
120. Tambabawod	*Neonauclea media*	/						1
121. Tamuyan		/						1
122. Tanguile		/						1
123. Tatanak	*Ficus botryocarpa* var. *botryocarpa*	/						1
124. Tigbay-tigbay					/			1
125. Tikog	*Cyperus* sp.					/		1
126. Trumpet	*Datura suaveolens* Humb.		/					1
	Et Bonpl.							1
127. Tubli	*Derris* sp.		/				/	2
128. Tugas nuai				/		/		2
129. Tulan manok					/			1
130. Tupi-tupi						/		1
131. Tutungaw	*Melastoma malabathricum*					/		1
132. Ulingon	*Decaspermum fruticosum*	/						1
133. Waling-waling	*Vanda sanderiana*		/					1
134. Yakal	*Shorea astylosa*	/						1
TOTAL		**51**	**39**	**16**	**31**	**25**	**1**	

Legend:

HC - For Housing construction
O - Ornamental
F - Fuel
H - Handicraft
OU - Other uses (Rope, Garden post, Mat-weaving)

Table 18. Plant species with sociocultural uses in Mt. Malindang.

Local name	Scientific name	BC	BH	BR	P	FI	GB	NB	FP	PR	W	F	C	B	BD	Total
1. Unknown	*Hyptis capitata*											/				1
2. Abihid, Salingkapaw									/							1
3. Agingay				/												1
4. Agusais				/												1
5. Ahos	*Allium sativum*									/						1
6. Alingatong	*Dendrocnide densiflora*				/											1
7. Amahong									/							1
8. Ananamsi	*Eurya acuminata*						/									1
9. Anonang										/						1
10. Aslum										/						1
11. Badyang	*Alocasia portei*								/							1
12. Bayante										/						1
13. Bihod-bihod/salingkapaw										/						1
14. Branch of any tree species		/														1
15. Bunlay				/												1
16. Burakan										/						1
17. Buongon	*Citrus grandis*									/					/	2
18. Busyong	*Ficus* sp.								/							1
19. Byasong										/						1
20. Daat	*Scleria scrobiculata*			/												1
21. Dalamdam	*Habenaria* sp.												/			1
22. Dama	*Cestrum nocturnum*			/												1
23. Dawa				/												1
24. Dahlia	*Dahlia* sp.									/						1
25. Hagimit									/							1
26. Handilib-on, Gabon	*Blumea* sp.					/										1
27. Handilika	*Kalanchoe pinnata* (Lamk.) Pers.											/				1
28. Herbabuena	*Mentha arvensis* L.					/										1
29. Hibi-hibi	*Mimosa pudica*												/			1
30. Humay	*Oryza sativa*		/							/						2
31. Internal parts of any flower			/													1
32. Gabi	*Colocasia esculentum*						/									1
33. Kachubong	*Datura* sp.			/												1
34. Kamantigue	*Impatiens balsamina*									/	/					2
35. Kamanyan	*Canarium hirsutum* var. *hirsutum*									/						1
36. Kamote	*Ipoemea batatas*								/							1
37. Kisol										/						1
38. Kogon	*Imperata cylindrica*			/												1
39. Kubong	*Dioscorea hispida*								/							1
40. Labigan										/						1
41. Labulag	*Macaranga bicolor*									/						1
42. Likway										/						1
43. Limbas-limbas	*Cyperus* sp.			/												1
44. Lingo-lingo										/						1
45. Lipayan											/					1
46. Lubi	*Cocos nucifera*							/	/							1
47. Luy-a	*Zingiber officinale*			/			/		/	/						3
48. Mais	*Zea mays*								/							1
49. Manan-aw	*Phalenopsis* sp.									/	/		/			3
50. Mayana pula	*Coleus blumei*			/							/					2
51. Mayana puti	*Coleus* sp.										/					1
52. Mote	*Solanum nigrum*								/							1
53. Nangka	*Artocarpus heterophylla*						/							/		2
54. Panaktakan										/						1
55. Pangandaw											/					1
56. Panyawan	*Tinosphora rumphii*									/						1
57. Pipino	*Cucumis sativus*							/								1
58. Pusaw							/			/						2
59. Sabinit	*Rubus* sp.			/												1
60. Saging	*Musa sapientum*								/							1
61. Salimbangon/ Handalusa	*Justicia gendarussa*			/						/	/					3
62. Salumaya				/							/					2
63. Sambulawan	*Sambucus javanica*									/						1

Table 18. Continued...

Local name	Scientific name	BC	BH	BR	P	FI	GB	NB	FP	PR	W	F	C	B	BD	Total
64. Sasayng									/							1
65. Sidra						/										1
66. Silangka	*Impatiens montalbanica*						/									1
67. Sipol				/												1
68. Suha				/					/	/						2
69. Suro-suro				/												1
70. Tabako	*Nicotiana tabacum*						/		/							1
71. Talid, Daat	*Scleria scrobiculata*			/												1
72. Talong-talong/Gabol	*Solanum torvum*			/												1
73. Tapalak										/						1
74. Tiwasi	*Costus speciosus*						/									1
75. Tuba-tuba, Kasla	*Jatropha curcas*						/		/	/						2
76. Tubli	*Derris* sp.								/							1
77. Tubo	*Saccharum officinarum*									/						1
78. Tubo-tubo											/					1
79. Tuyabang	*Molinaria capitulata*								/							1
TOTAL		**1**	**2**	**18**	**1**	**3**	**9**	**3**	**19**	**26**	**10**	**1**	**3**	**1**	**1**	

Legend:

C - Courtship, charm
BC - Birth control
BH - Building a house
BR - Burial rite
P - Protection
FI - First infant's bath
GB - Giving birth
NB - New-born baby
FP - Farming practices
PR - Pregnancy, Conception
W - Wedding
F - Fear
B - Business
BD - Birthday

Table 19. Species importance value (SIV) of trees within sampling quadrats in Mt. Ginanlajan, Brgy. Lake Duminagat.

Rank	Species	SIV
1	*Polyosma philippinensis* Merr.	22.9
2	*Clethra lancifolia* Turez	20.8
3	*Adinandra robinsonii* Elm.	15.1
4	*Calophyllum lancifolium* Elm.	9.06
5	*Cyathea brevipes*	8.97
6	*Elmerillia platyphylla* (Merr.) Noot	8.63
7	*Rapanea avenis* (Blm.) Mez.	8.39
8	*Symplocos villarii* Vid.	8.34
9	*Sapium luzonicum* (Vid.) Merr.	8.14
10	*Cinnamomum mercadoi* Vidal	6.71
11	*Lithocarpus sulitii* Soep.	5.84
12	*Lithocarpus mindanaensis* (Elm.) Rend.	5.69
13	*Gordonia luzonica* Vid.	5.68
14	*Macaranga dipterocarpifolia* Merr.	5.05
15	*Ardisia* sp.	5.04
16	*Evodia confusa* Merr.	4.57
17	*Adinandra montana* Merr.	3.98
18	*Flacourtia rukam* Zoll. & Mor.	3.98
19	*Prunus grisae* var. *grisae* (Blume) kalkm.	3.96
20	*Hydrangea chinensis* Maxim.	3.95
21	*Elaeocarpus calomala* (Blco.) Merr.	3.36
22	*Neonauclea media* (Hawil) Merr.	3.36
23	*Syzygium hutchinsonii* (Merr.) Merr.	3.34
24	*Pometia pinnata* Forst.	1.69
25	*Chisocheton pentandrus* ssp. *Pentandrus* (Blanco) Merr.	1.68
26	*Rhodomyrtus* sp.	1.68
27	*Callicarpa eriocloma* Schauer	1.67
28	*Calophyllum blancoi* Pl. & Tr.	1.67
29	*Cinnamomum mindanaense* Elmer	1.67
30	*Dracontomelon edule* (Blco.) Skeels	1.67
31	*Eusideroxylon zwageri* Teijsm. & Binn.	1.67
32	*Ficus binnendykii* var. *coriacea* Corner	1.67
33	*Ficus nota* (Blanco) Merr.	1.67
34	*Ficus septica* var. *septica* Burm. F.	1.67
35	*Leea guineensis* G. Don	1.67
36	*Lithocarpus philippinensis* (A.DC.) Rend.	1.67
37	*Mastixia premnoides (Elm.) Hallier F.*	1.67
38	*Parinari* sp.	1.67
39	*Schefflera* sp.	1.67
40	Unidentified Patilo	1.67
41	Unidentified Tubo	1.67
42	Unidentified tulan manok	1.67

Table 20. Species importance value (SIV) of trees within sampling quadrats in Palo 6, Brgy. Mansawan.

Rank	Species	SIV
1	*Cyathea brevipes*	78.73
2	*Lithocarpus philippinensis* (A.DC.) Rend.	36.43
3	*Pometia pinnata* Forst.	20.34
4	*Macaranga dipterocarpifolia* Merr.	18.01
5	*Unidentified species (Babasa lahi)*	16.28
6	*Chisocheton pentandrus* ssp. *pentandrus* (Blanco) Merr.	13.7
7	*Ternstroemia megacarpa* Merr.	9.45
8	*Callicarpa eriocloma* Sch.	8.62
9	*Cinnamomum mercadoi* Vidal	8.175
10	*Ficus* sp.	6.708
11	*Sapium luzonicum* (Vid.) Merr.	6.07
12	*Lithocarpus sulitii* Soep.	5.779
13	*Syzygium simile* (Merr.) Merr.	5.367
14	*Memecylon caeruleum* Jack	5.15
15	*Clethra lancifolia* Turez	4.968
16	Unidentified Tulan manok	4.942
17	*Pometia pinnata forma repanda*	4.826
18	Unidentified species (Manga-manga)	4.119
19	*Astrocalyx calycina* (Vidal) Merr.	4.038
20	*Ficus botryocarpa* var. *botryocarpa* Miq.	4.038
21	*Dacrydium elatum* (Roxb.) Wall.	2.835
22	*Agathis philippinensis* Ward.	2.419
23	*Flacourtia rukam* Zoll. & Mor.	2.248
24	*Adinandra montana* Merr.	2.224
25	*Parinari corymbosa* (Blume) Mig.	2.117
26	*Polyosma philippinensis* Merr.	2.099
27	*Acer laurinum* Hassk	2.082
28	Unidentified species (Nangka-nangka)	2.082
29	*Eusideroxylon zwageri* Teijsm. & Binn.	2.037
30	*Evodia confusa* Merr.	2.037
31	*Dendrocnide densiflora* (C.B.Rob) Chew	2.025
32	*Ficus septica* var. *septica* Burm. F.	2.025
33	*Phyllocladus hypophyllus* Hook. F.	2.025
34	*Saurauia* sp.	2.025
35	*Calophyllum blancoi* Pl. & Tr.	2.013
36	*Gordonia luzonica* Vidal	2.013

Table 21. Number of species within subquadrats and subsubquadrats and their conservation status.

Conservation status	Total number of species		
	Mt. Ginanlajan	Palo 6	In 2 plots
Endangered (EN)	1 [1]	1	2
Endemic (ECS)	54*	55*	71
Depleted (D)	8	8	2
Rare (R)	5 (15)	11 (15)	11 (19)
Economically Important Species (EIS)	102	103	171
Socioculturally Important Species (SIS)	9	3	10

* 100% inventory of trees
( ) Local assessment
[ ] Outside sampling plots

Table 22. Inventory of tree species and endemism in 1-ha plot in Malindang Range.

Locality	Species				
	Identified	Unidentified	Total	Endemic (%)	Individuals
Mt. Ginanlajan	62	5	67	40 (60%)	961
Palo 6	59	4	63	38 (60%)	1000

Table 23. Species richness and endemic species within subquadrats and subsubquadrats in Malindang Range.

Plant Groups	Species		Endemic (%)	
	Mt. Ginanlajan	Palo 6	Mt. Ginanlajan	Palo 6
Angiosperms	132	115	39 (30%)	48 (42%)
Gymnosperms	3	3	2 (67%)	2 (67%)
Pteridophytes	23	47	1 (4%)	7 (15%)
Bryophytes	10	47		
Lichen	2	4		
Fungi		0		
TOTAL	**205**	**216**	**42**	**57**

Table 24. Species richness and endemic species within subquadrats and sub subquadrats in Malindang Range.

Habit	Species		Endemic (%)	
	Mt. Ginanlajan	Palo 6	Mt. Ginanlajan	Palo 6
Trees	79	68	28 (35%)	33 (49%)
Shrubs	15	20	5 (33%)	7 (35%)
Herbs	20	18	4 (20%)	4 (22%)
Vine	18	9	2 (11%)	4 (44%)
Total	**132**	**112**	**39 (30%)**	**48 (42%)**

Table 25. List of endemic species within subquadrats and subsubquadrats in Malindang Range.

Family/Species	Distribution	Palo 6	Mt. Ginanlajan
A. TREES			
I. Anacardiaceae			
1. *Dracontomelon edule*	Luzon (Bataan, Rizal, Bulacan, Batangas, Laguna, Tayabas, Camarines, Sorsogon), Tablas, Samar, Mindanao (Cotabato)	/	/
II. Araliaceae			
2. *Aralia bipinnata*	Luzon (Bontoc, Benguet, Nueva Ecija, Bataan, Tayabas, Albay) Leyte, Negros	/	
III. Bignoniaceae			
3. *Radermachera whitfordii*	Mindanao (Bukidnon, Davao, Cotabato, Lanao, Zamboanga)	/	
IV. Clethraceae			
4. *Clethra lancifolia*	Luzon (Cagayan to Sorsogon), Mindoro, Leyte, Negros, Mindanao (Bukidnon, Lanao)	/	/
V. Clusiaceae			
5. *Calophyllum blancoi*	Luzon (Cagayan to Sorsogon), Ambil, Palawan, Masbate, Leyte, Panay, Mindanao (Surigao, Lanao, Zamboanga)	/	/
VI. Cornaceae			
6. *Maxtixia premnoides*	Mindanao (Davao, Bukidnon, Lanao)	/	/
VII. Elaeocarpaceae			
7. *Elaeocarpus calomala*	Luzon (Isabela, Rizal, Bataan, Laguna, Tayabas, Albay), Mindoro	/	/
VIII. Euphorbiaceae			
8. *Glochidion album*	Luzon (Cagayan to Sorsogon), Mindoro, Panay, Leyte, Samar, Siargao, Dinagat, Mindanao	/	/
9. *Glochidion canescens*	Luzon (Laguna)		/
10. *Sapium luzonicum*	Luzon (Ilocos Sur, Bulacan, Rizal, Bataan, Laguna), Mindoro, Palawan, Ticao, Bucas Grande, Mindanao (Davao)	/	/
IX. Lauraceae			
11. *Lithocarpus mindanaensis*	Leyte, Mindanao (Lanao, Zamboanga, Davao, Misamis)	/	/
12. *Lithocarpus ovalis*	Luzon (Cagayan to Camarines)	/	/
13. *Lithocarpus philippinensis*	Luzon (Zambales, Tayabas, Laguna, Rizal)		/
14. *Cinnamomum mercadoi*	Babuyan Islands, Northern Luzon to Mindanao	/	/
15. *Cinnamomum mindanaense*	Mindanao (Surigao, Davao, Zamboanga)	/	/
16. *Neolitsea vidalii*	Luzon (Cagayan, Bataan, Rizal, Laguna, Tayabas, Camarines, Sorsogon), Mindoro, Guimaras, Mindanao, Basilan	/	/
X. Magnoliaceae			
17. *Elmerillia platyphylla*	Leyte, Agusan, Lanao, Zamboanga	/	/
18. *Talauma reticulata*	Dinagat	/	/

Table 25. Continued...

Family/Species	Distribution	Palo 6	Mt. Ginanlajan
XI. Melastomataceae			
19. *Astrocalyx calycina*	Luzon (Laguna, Tayabas, Sorsogon), Catanduanes, Leyte		/
20. *Astronia cumingiana*	Luzon (Cagayan to Sorsogon, all or most provinces), Mindoro, Leyte, Mindanao, Basilan	/	/
21. *Everettia pulcherrima*	Catanduanes, Leyte, Negros, Mindanao (Misamis, Bukidnon, Davao)	/	/
XII. Meliaceae			
22. *Chisocheton pentandrum*	Babuyan Islands, Luzon (Cagayan to Albay), Mindoro, Masbate, Leyte, Samar, Negros, Panay, Mindanao	/	
23. *Toona calantas*	Batan Islands, Luzon (Cagayan to Sorsogon), Mindoro, Samar, Negros, Leyte, Cebu, Mindanao		/
XIII. Moraceae			
24. *Ficus irisana*	Luzon (Benguet, Nueva Ecija, Rizal, Laguna, Camarines), Panay, Camiguin de Misamis	/	/
25. *Ficus nota*	Batan Islands, Luzon (Cagayan to Sorsogon), Polillo, Mindoro, Culion, Palawan, Balabac, Samar, Biliran, Leyte, Panay	/	/
26. *Ficus septica*	Samar, Mindanao (Bukidnon)	/	/
27. *Ficus cardinalicarpa*	Palawan		/
XIV. Myrtaceae			
28. *Syzygium simile*	Luzon, Mindoro, Masbate, Negros, Mindanao	/	
29. *Syzygium huchinsonii*	Basilan		/
XV. Palmae			
30. *Pinanga philippinensis*	Babuyan Islands, Luzon (Cagayan, Ilocos Norte, Ifugao, Bontoc, Benguet, Pangasinan, Nueva Vizcaya, Bulacan, Rizal, Bataan, Zambales, Laguna, Tayabas, Sorsogon), Mindoro, Leyte, Negros, Panay		/
XVI. Rosaceae			
31. *Prunus grisae*	Sorsogon, Negros, Bohol, Leyte, Mindanao	/	/
XVII. Rubiaceae			
32. *Wendlandia williamsii*	Mindanao (Zamboanga)	/	
33. *Gardenia longiflora*	Luzon (Cagayan, Isabela, Rizal, Laguna, Tayabas, Camarines, Sorsogon), Busuanga, Palawan, Samar, Sibuyan, Mindanao (Zamboanga)		/
34. *Neonauclea media*	Luzon (Cagayan, Amburayan, Bataan, Rizal, Laguna, Tayabas, Batangas), Mindoro, Panay, Mindanao		
XVIII. Rutaceae			
35. *Melicope monophylla*	Panay, Mindanao (Bukidnon, Butuan, Cotabato, Lanao, Davao, Zamboanga)	/	
XIX. Saurauiaceae			
36. *Saurauia elegans*	Luzon (Ilocos Norte, Bontoc, Lepanto, Benguet, Nueva Viscaya, Nueva Ecija, Tayabas, Bataan, Camarines, Albay), Mindoro, Palawan		/
37. *Saurauia fasciculiflora*	Mindanao (Surigao)	/	/
38. *Saurauia glabrifolia*	Mindanao (Davao)	/	/
39. *Saurauia involucrata*	Luzon (Cagayan to Sorsogon), Polillo		/
40. *Saurauia latibractea*	Mindoro, Cebu		/

Table 25. Continued...

Family/Species	Distribution	Palo 6	Mt. Ginanlajan
XX. Saxifragaceae			
41. *Polyosma philippinensis*	Luzon (Benguet, Zambales, Tayabas, Bataan, Laguna, Camarines, Sorsogon), Mindoro	/	/
XXI. Symplocaceae			
42. *Symplocos villarii*	Luzon (Cagayan, Zambales, Bataan, Rizal, Laguna, Tayabas, Sorsogon), Mindoro, Samar, Mindanao (Davao)		/
XXII. Theaceae			
43. *Adinandra montana*	Luzon (Ilocos Norte, Benguet, Nueva Ecija, Tayabas, Camarines), Mindoro, Panay, Mindanao (Bukidnon, Misamis, Davao)	/	
44. *Gordonia luzonica*	Luzon (Benguet, Bataan, Zambales, Laguna, Sorsogon), Negros, Panay, Mindanao (Lanao, Bukidnon, Surigao	/	/
45. *Ternstroemia megacarpa*	Mindanao (Lanao, Bukidnon)	/	
46. *Pyrenaria mindanaensis*	Mindanao (Lanao, Bukidnon)	/	/
XXIII. Urticaceae			
47. *Dendrocnide densiflora*	Mindoro, Camiguin de Misamis, Zamboanga	/	/
TOTAL		**34**	**41**
B. SHRUB			
I. Araliaceae			
1. *Schefflera odorata*	Batan Islands and northern Luzon to Palawan and Mindanao	/	/
II. Ericaceae			
2. *Vaccinium jagori*	Luzon (Isabela, Abra, Lepanto, Bontoc, Benguet, Zambales, Bataan, Rizal, Tayabas)	/	
III. Gesneriaceae			
3. *Cyrtandra cumingii*	Batan Islands, Luzon (Cagayan, Benguet, Rizal, Laguna, Tayabas, Camarines, Mindoro, Panay, Mindanao (Bukidnon)	/	/
4. *Cyrtandra parvifolia*	Luzon (Ifugao, Benguet), Mindoro, Panay, Negros, Mindanao (Agusan, Bukidnon, Misamis)	/	
5. *Cyrtandra umbellifera*	Batan Islands	/	/
IV. Melastomataceae			
6. *Medinilla clementis*	Luzon (Apayao, Ifugao, Benguet, Laguna, Tayabas, Camarines), Mindoro, Catanduanes, Camiguin de Misamis, Mindanao	/	/
V. Saxifragaceae			
7. *Dichroa philipinnensis*	Luzon, Mindoro, Catanduanes, Camiguin de Misamis, Mindanao	/	/
TOTAL		**7**	**5**

Table 25. Continued...

Family/Species	Distribution	Palo 6	Mt. Ginanlajan
C. HERBS			
I. Compositae			
1. *Blumea bicolor*	Panay, Camiguin de Misamis, Mindanao (Zamboanga)	/	
II. Balsaminaceae			
2. *Impatiens montalbanica*	Luzon (Rizal)	/	/
III. Begoniaceae			
3. *Begonia copelandii*	Luzon (Cagayan), Panay, Mindanao (Davao)	/	/
4. *Begonia cumingii*	Luzon (Laguna, Tayabas), Mt. Banahaw, Mt. Makiling	/	
IV. Urticaceae			
5. *Elatostema pulchellum*	Luzon (Tayabas, Laguna), Mindanao		
TOTAL		**4**	**3**
D. VINES			
I. Asclepiadaceae			
1. *Dischidia lancifolia*	Luzon (Sorsogon), Catanduanes, Mindanao (Bukidnon)		/
II. Gesneriaceae			
2. *Dichrotricum chorisepalum* C.B. Clarke	Luzon (Cagayan, Laguna, Tayabas, Sorsogon), Mindoro, Biliran, Leyte, Panay, Negros, Camiguin de Misamis, Mindanao (Lanao, Agusan, Misamis, Zamboanga)	/	/
III. Pandanaceae			
3. *Freycinetia negrosensis*	Luzon (Laguna, Sorsogon), Leyte, Negros, Mindanao (Agusan)	/	/
IV. Rubiaceae			
4. *Psychotria diffusa* Merr.	Luzon (Bontoc, Lepanto, Benguet, Bataan, Rizal, Laguna, Tayabas, Albay, Sorsogon), Mindoro, Leyte, Negros, Mindanao (Bukidnon)	/	/
TOTAL		**3**	**4**

Table 26. List of socioculturally important species.

Family/Species	Local name	Sociocultural use
I. Balsaminaceae		
1. *Balsamina montalbanica*	Silangka	Child delivery
II. Cyperaceae		
2. *Scleria scrobiculata*	Limbas-limbas	Burial rite
III. Euphorbiaceae		
3. *Glochidion canescens*	Tulog-tulog	"Anting-anting"
4. *Macaranga bicolor*	Labulag	Conception
IV. Moraceae		
5. *Ficus nota*	Busyong	Farming practices
V. Orchidaceae		
6. *Goodyera* sp.	Dalamdam	Personal Charm, Courtship
VI. Rosaceae		
7. *Rubus* sp.	Sampinit	Fishing
VII. Rubiaceae		
8. *Gardenia longiflora*	Tamilok	Hunting
VIII. Solanaceae		
9. *Solanum* sp.	Gabol	Burial rite
IX. Unidentified		
10. *Xylaria hypoxylon*	Oten-oten sa unggoy	Pregnancy

Table 27. Tree species recommended by the Subanens for reforestation.

No.	Species	Official name
1	*Agathis philippinensis*	Almaciga
2	*Calophyllum blancoi* Pl. & Tr.	Bitanghol
3	*Chisocheton pentandrus* var. *pentandrus* (Blanco) Merr.	Katong matsing
4	*Cinnamomum mercadoi* Vidal	Kalingag
5	*Dacrydium elatum* (Roxb.) Wall	Lokinai
6	*Dracontomelon edule* (Blanco) Skeels	Lamio
7	*Elmerilla platyphylla* (Merr.) Noot	Hangilo
8	*Ficus botryocarpa* var. *botryocarpa* Mig.	Basikong
9	*Flacourtia rukam* Zoll & Morr	Bitongol
10	*Lithocarpus philippinensis* (A. DC) Rend.	Pangnan bundok
11	*Mastixia premnoides* (Elm.) Hallier f.	Mindanao apanit
12	*Parinaria corymbosa* (Blumea) Mig	Liusin
13	*Phyllocladus hypophyllus* Hook f.	Dalung
14	*Pometia pinnata* Forst.	Malugai
15	*Sapium luzonicum* (Vid.) Merr.	Balakat gubat

Project Leader: **Jose B. Arances**
Study Leader: **Victor B. Amoroso**
Research Collaborators: **William Sm. Gruezo**, **Colin Ridsdale**, **Leontine Visser**, **Benito C. Tan**
Research Staff: **Lilibeth V. Rufila**, **Jennifer B. Galvezo**, **Guiller S. Opiso**
Subanen Researchers: **Rufino Comilap**, **Carlos Lumaray**, **Carmilo Comilap**, **Noli Pacut**, **Benigno Montimar**, **Sulficio Sacal**

Editing/Layout: **Elizabeth M. Libas**
Production Assistant: **Carina S. Fule**

Biodiversity Research Programme (BRP)
for Development in Mindanao:
Focus on Mt. Malindang and Environs

National Support Secretariat (NSS)
SEAMEO SEARCA, College, Laguna
4031 Philippines

Site Coordinating Office (SCO)
Don Anselmo Bernad Avenue
cor. Jose Abad Santos St.
Ozamiz City
7200 Philippines

ISBN 971-560-105-7