Macrofloral Diversity of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines

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Macrofloral species richness, relative density, relative abundance and diversity index of the protected forest and riverine ecosystems of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines were determined employing the modified quadrat method. There were 68 families, 170 genera, and 218 plant species listed in the entire study area of 0.16 hectare. The riverine ecosystem had a higher species richness (S=137) compared with the protected forest ecosystem (S=126). The top three major families observed in the protected forest ecosystem were Euphorbiaceae, Moraceae, and Annonaceae families and for the riverine ecosystem they were the Moraceae, Poaceae, Euphorbiaceae and Papilionaceae families. Plant genera that belong to the families Euphorbiaceae and Annonaceae dominated the protected forest ecosystem and the plant genera belonging to families Poaceae and Cyperaceae dominated the riverine ecosystem.

Relative abundance in the herb-dominated riverine ecosystem was significantly higher than that of the tree-dominated protective forest ecosystem with values of 43,466 and 7,007 individuals, respectively. Computed diversity index was higher in the riverine ecosystem (H'=3.30) than the protected forest ecosystem (H'=2.69), both categorized as areas of moderate level of species diversity. In the entire study area, 28 (12.84%) plant species are known to have threatened conservation status; three of these are critically endangered, namely kamagong (***Diospyros philippensis*** Desr.) Gurke), prickly narra (***Pterocarpus indicus*** Willd. forma ***echinatus***), and red lauan (***Shorea negrosensis*** Foxw.). Endemic plant species were inventoried that need to be conserved and protected.

This study provides comprehensive baseline information on the macrofloral diversity of Bulabog-Putian Natural Park. Data gathered from this study will enhance knowledge on biodiversity for the local

or national government to implement strong conservation and protection programs for the endemic and indigenous plant species in their natural habitat and to prevent biodiversity loss that may be aggravated by climate change.

KEYWORDS: Macroflora, diversity, protected forest, riverine, species richness, diversity index, endemic species, threatened species.

INTRODUCTION

Biodiversity refers to the biological variability either at level of species richness, ecosystem diversity or genetic variation (Orourke, 2006). It plays an important role in sustaining life on Earth. It supplies a diverse range of products and services of immense economic value (Holdgate, 1996). It can significantly reduce the risk of damage caused by climate change to ecosystems by protecting forest ecosystems and increasing the size of existing carbon pools to reduce greenhouse emissions (Uriarte, 2009). Thus, promoting biodiversity conservation coupled with planting of trees is one practical action or solution to climate change (Fuentes, 2009). On the other hand, poor management of land and plant species in both the forest and adjacent river ecosystems could lead to loss of biodiversity (Dynesius, 2004).

Species richness is the most commonly used indicator of biodiversity; the more diverse an ecosystem the more resistant it is when environmental conditions change (Orourke, 2006). This indicator is used to characterize an ecosystem by simply identifying and counting the species that are present to describe and compare communities. However, this method misses the information that some species are rare and others are common. A species diversity index to measure the character of a community—both the abundance patterns and species richness—should be taken into account (Begon, Harper & Townsend, 1990).

Few studies have been done in the Western Visayas. A floristic survey has been undertaken in Bulabog-Putian Natural Park (BPNP), Dingle, Iloilo, however, this was focused only on the forest ecosystem. No assessment was done on the riverine habitat (Gallaza, 2009). In the basic inventory of Fuentes and Andraje (2008), they enumerated over 200 various plant species in BPNP, a number of which are unique and threatened. This inventory comprised only about 2% of

the total number of plant species in the Philippines (Bennert, 2006). A significant number of these plant species has been categorized as critically endangered, endangered, vulnerable, and threatened while other non-threatened plants have the tendency to become threatened (Madulid, 2000; Reyes, 2007; Villegas & Pollisco, 2008; So, 1994; Sopsop & Buot, 2009). The DENR (2007) reported a partial list of 432 plant species in Western Visayas while Elefan (2002, 2004, 2005), Madulid (2002) and Hamann, Barbon, Curio, and Madulid (2004) conducted their independent botanical inventory in Iloilo, Northwest Panay and North Negros Forest Reserve, respectively.

The present investigation was carried out both in the protected forest ecosystem dominated by secondary growth plant species and the riverine ecosystem, a terrestrial landscape adjacent to river water with notable high biodiversity and ecological relevance in BPNP. This was conducted to document and evaluate plant species richness, relative density, relative abundance, and index of diversity. The data gathered from this study provided more comprehensive baseline information on plant diversity in BPNP to augment the regional biodiversity knowledge and compliment the national conservation efforts being implemented in the country as one of the adaptation measures to reduce the negative impact of climate change.

MATERIALS AND METHODS

Two ecosystem types in BPNP were considered in this study to compare the results of the inventory of macroflora in the protected forest ecosystem along Guiso cave vicinity and the riverine ecosytem in the vicinity of Sitio Tina, Barangay Moroboro and Sitio Pakpak Banog, Barangay Lincud, Dingle, Iloilo. Macroflora were inventoried from the eight quadrats (10 x 10 m^2) established along 200-meter transect on each ecosystem type for a total sampling plot area of 1,600m^2 (0.16 ha). Individual plants in each quadrat were counted, listed, identified, and classified, and their specific conservation status was determined. Reputable publications were used and local and international experts consulted to confirm the identification of plant species. Relative density (ni), relative abundance (N), species richness (S), and index of diversity (H') of the two ecosystem types were determined to evaluate their present diversity status.

RESULTS

Floral Composition. The protected forest ecosystem, a mixed tropical lowland second growth forest, had a total of 7,007 individual plants (N) counted in eight quadrats that belong to 56 families, 110 genera, and 126 species. Of the 126 plant species, 120 (95.24%) were flowering and only six (4.76%) were non-flowering, composed of fern species and allies. The riverine ecosystem had 43,466 individual plants counted that belonged to 54 families, 110 genera, and 137 species of which 127 (92.70%) plant species identified were flowering and 10 (7.29%) were non-flowering composed of ferns and their allies. The combined assessment of both ecosystems showed a total of 50,473 individuals distributed under 68 families, 178 genera, and 218 species (Table 1).

Table 1.

Floral composition of the sampling plots in the two ecosystem types in Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.

Ecosystem Types	Total Individuals (N)	No. of Families	No. of Genera	No. of Species	Flowering Species		Non-flowering Species	
					No.	%	No.	%
Protected Forest Ecosystem	7,007	56	110	126	120	95.24	6	4.80
Riverine Ecosystem	43,466	54	110	137	127	92.70	10	7.29
Combined Assessment	50,473	68	178	218	208	95.41	10	4.59

Distribution of Plant Species According to Major Plant Groups. In the protected forest ecosystem, vegetation was dominated by trees with 71 (56.35%) plant species identified, followed by shrubs, 24 (19.20%), climbers/vines, 14 (11.11%), herbs, 10 (7.94%), ferns and allies, 6 (4.80%), and palm, 1(0.79%). Meanwhile, in the riverine ecosystem, trees still prevailed with 55 (40.15%) species identified, followed by

herbs, 28 (20.44%), shrubs, 25 (18.25%), vines/climbers, 13 (9.49%), ferns and allies, 10 (7.30%), and palms, 6 (4.38%) (Table 2).

Table 2.

Distribution of flowering and non-flowering species according to major plant groups in the two ecosystem types in Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.

Ecosystem Types	Flowering Plant Species										Non-flowering	
	Trees		Shrubs		Herbs		Climbers/ Vines		Palms		Ferns / Allies	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
Protected Forest Ecosystem	71	56.35	24	19.20	10	7.94	14	11.11	1	0.79	6	4.80
Riverine Ecosystem	55	40.15	25	18.25	28	20.44	13	9.49	6	4.38	10	7.30

Major Families, Genera, Species. In the protected forest ecosystem, 11 (19.64%) of the 56 total number of families had at least four or more plant species identified and seven (12.5%) families had four or more genera. Family Euphorbiaceae had the highest species count (nine) followed by Moraceae with seven of the 126 species listed. Euphorbiaceae and Annonaceae recorded the most genera with six apiece. The riverine ecosystem was home to 54 plant families of which 13 (24.07%) have at least four plant species and nine (16.66%) families have at least four genera. There were 10 (18.50%) families that dominated with at least five species and 44 (81.48%) were minor plant families with four and less species each of the 137 species listed. The major families with their corresponding species count include, among others, Moraceae, 11 (8.03%), Poaceae, 10 (7.30%), and Euphorbiaceae and Papilionaceae, seven (5.11%). Poaceae registered the most genera with eight (Table 3).

Composite Plant Diversity Status. The riverine ecosystem had a significantly higher abundance (N=43,466) than the protected forest ecosystem (N=7,007) (Table 4). This can be explained by the immensity of the grasses, sedges, and other herbs on the river banks. The riverine

Table 3.

Major plant families in the two types of ecosystem having at least four species and genera.

PROTECTED FOREST ECOSYSTEM				RIVERINE ECOSYSTEM			
No. of Families (N=56)	**No. of Species (N=126)**	**Families**	**No. of Genera (N=110)**	**No. of Families (N=54)**	**No. of Species (N=137)**	**Families**	**No. of Genera (N=110)**
Euphorbiaceae	9	Euphorbiaceae	6	Moraceae	11	Poaceae	8
Moraceae	7	Annonaceae	6	Poaceae	10	Rubiaceae	6
Annonaceae	5	Araceae	5	Euphorbiaceae	7	Arecaceae	6
Araceae	5	Anacardiaceae	5	Papilionaceae	7	Asteraceae	5
Sterculiaceae	5	Sapindaceae	4	Arecaceae	6	Euphorbiaceae	5
Zingiberaceae	5	Moraceae	4	Rubiaceae	6	Papilionaceae	5
Anacardiaceae	5	Zingiberaceae	4	Verbenaceae	6	Mimosaceae	4
Sapindaceae	5			Asteraceae	5	Rutaceae 4	
Burseraceae	4			Cyperaceae	5	Verbenaceae	4
Rutaceae 4				Convolvulaceae	5		
Verbenaceae	4			Rutaceae	4		
				Anacardiaceae	4		
				Mimosaceae	4		

Table 4.

Composite plant diversity status of the two ecosystems in Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines and their recorded Abundance (N), Species Richness (S), and Diversity Index (H').

Ecosystem Type	Abundance (N)	Species richness (S)	Diversity Index (H')*	Phytodiversity Level
Protected Forest Ecosystem	7,007	126	2.69	Moderate
Riverine Ecosystem	43,466	137	3.30	Moderate

*The higher the H'value, the higher is the species diversity of the sampling site.

ecosystem also had higher species richness (S=137) and composite diversity index (H'=3.30) over the protected forest ecosystem (S=126, H'=2.69). Both ecosystems had a moderate level of plant diversity according to Shannon-Wiener Diversity Index (H') (reflected in Table 9).

Plant Diversity Status Among Major Plant Groups. In the protected forest ecosystem, trees had the highest individual count (N=3,267), highest species richness (S=71), and diversity index (H'=1.94). Palms recorded the lowest count (N=210), species richness (S=1), and diversity index (H'0.00) among plant groups. Taquipan or fish tail palm (*Karyota cumingii*) was the only recorded palm species in the sampling plots. In the riverine ecosystem, herbs had the highest individual count (N=40,558) and palms the lowest (N=17). Trees recorded the highest species richness (S=55) and diversity index (H'=2.94). Palms had the lowest species richness (S=6) while climbers /vines recorded the lowest diversity index (H'=1.49) (Table 5).

Table 5.

Comparison of plant diversity status among major plant groups in the two ecosystem types in Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines

Major Plant Groups	Ecosystem Types					
	Protected Forest			Riverine		
	N	S	H'	N	S	H'
Trees	3,267	71	1.94	772	55	2.94
Shrubs	495	23	1.67	831	25	2.00
Herbs	1,043	10	1.52	40, 558	28	2.01
Climbers/Vines	224	14	1.78	994	13	1.49
Palms	210	01	0.00	17	06	1.64
Ferns/allies	1,768	06	0.44	379	10	1.62

N=Abundance (Total no. of individuals in 800 sq. m. sampling area / ecosystem); S= Species richness (number of plant species in the ecosystem); H' =Shannon-Wiener Diversity index.

Plant Conservation Status. For the plant species with threatened conservation status and their occurrence in BPNP (Table 6), at least 28 (12.84%) of the 218 plant species in both ecosystems have threatened

Table 6.

Plants within the sampling plots with threatened conservation status and their occurrence in Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.

Taxon (N=28)	Local/Common Name	Family	Conservation Status	Occurrence	
				Protected Forest	Riverine Ecosystem
Diospyrus philippensis	Kamagong	Ebenaceae	Critically endangered	X	–
Pterocarpus indicus form *echinatus*	Prickly narra	Papilionaceae	Critically endangered	X	–
Shorea negrosensis	Red lauan	Dipterocarpaceae	Critically endangered	X	–
Pterocymbium tinctorium	Taluto	Sterculiaceae	Vulnerable/Rare	X	X
Koordersiodendron pinnatum	Amugis	Anacardiaceae	Vulnerable	X	-
Ficus pseudopalma	Niog-niogan	Moraceae	Vulnerable	X	X
Gmelina arborea	Yemane	Verbenaceae	Vulnerable	-	X
Ficus ulmifolia	Isis	Moraceae	Vulnerable	-	X
Artocarpus blancoi	Antipolo	Moraceae	Vulnerable	X	-
Alstonia macrophylla	Batino	Araliaceae	Depleted	X	
Calophyllum inophyllum	Bitaog	Clusiaceae	Depleted	X	
Cratoxylum sumatranum	Paguringon	Hypericaceae	Depleted	X	X
Cordia dichotoma	Anonang	Annonaceae	Depleted	X	-
Dysoxylum gaudichaudianum	Igyo	Meliaceae	Depleted	X	X
Guioa koelrueteria	Alahan	Sapindaceae	Depleted	X	-
Litsea glutinosa	Sablot	Lauraceae	Depleted	X	X
Mallotus philippensis	Banato	Euphorbiaceae	Depleted	X	X
Parkia timoriana	Kupang	Mimosaceae	Depleted	X	-
Rollinia deliciosa	Biriba	Annocaeae	Depleted	X	X
Strombosia philippinensis	Tamayuan	Oleacaceae	Depleted	X	-
Pterospermum diversifolium	Bayok	Sterculiaceae	Depleted	X	X
Wrigthia pubescens	Lanite	Apocynaceae	Depleted	X	X

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Table 6. (Continued...)

Plants within the sampling plots with threatened conservation status and their occurrence in Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.

Taxon (N=28)	Local/Common Name	Family	Conservation Status	Occurrence	
				Protected Forest	Riverine Ecosystem
Buchanania arborescens	Balinghasai	Anacardiaceae	Depleted	X	X
Canarium asperum	Pagsahingin	Burseraceae	Depleted	X	-
Nauclea orientalis	Bangkal	Rubiaceae	Depleted	-	X
Pometia pinnata	Malugai	Sapindaceae	Depleted	X	X
Polyscias nodosa	Malapapaya	Araliacaea	Depleted	-	X
Pterospermum obliquum	Kulatingan	Sterculiaceae	Depleted	X	-

28 species = 12.8% (Threatened)

conservation status (DENR DAO No. 1, 2007, Fernando et al., 2008; Villegas & Pollisco, 2008; De Guzman, Umali, & Sotalbo, 1986). Three are critically-endangered species: kamagong (*Diospyros pyrus philippensis*), prickly narra (*Pterocarpus indicus forma echinatus*), and red lauan (*Shorea negrosensis*). Another three species were reported as rare namely, taluto (*Pterocymbium tinctorium*) a monotypic genus, bayok (*Pterospermum diversifolium*), and biriba (*Rollinia deliciosa*).

Vegetation Analysis of the Two Ecosystem Types

Protected Forest Ecosystem. The vegetation type in the sampling area was a tropical lowland mixed second growth forest interspersed with coffee plantation indicative of its utilization for upland agriculture. A number of saplings and wildlings of original dipterocarp species such as the red lauan (*Shorea negrosensis*) still existed and was captured in sampling plots. The protected forest ecosystem recorded a moderate diversity index (H'=2.69). Its present diversity status is indicative of anthropogenic exploitation of the park and other habitat stressors like forest fire that have contributed to the decline in the population of endemic and indigenous species. Among the plant groups, index of diversity was low to moderate (H'= 0.00–1.94) with palms and trees as the lowest and highest, respectively. Composite inventory of vascular plants were recorded (Table 7).

Riverine Ecosystem. In Sitio Tina, Barangay Moroboro, the vegetation type in the study plots belonged to a mixed plantation—brushland with big parcel of cogon-dominated grassland along Jalaur river bank. The flatground in the eastern portion had been under cultivation and planted to seasonal agricultural crops such as corn (*Zea mays*), mungbean (*Vigna radiata*) and sweet potato (*Ipomoea batatas*)—the reason for the invasion of typical crop-associated weed species such as baludgangan (*Digitaria setigera*), borreria (*Borreria laevis*), dilang aso (*Pseudoelephantopus spicatus*), halos (*Digitaria ciliaris*) kurukawayan (*Leptochloa chinensis*), lobi-lobi (*Phyllanthus niruri*) and tayok-tayok (*Fimbristylis dichotoma*), among others. Climbers/vines included bika (*Ampelocissus martini*), burakan (*Merremia peltata*), centrosema (*Centrosema pubescens*), and yam (*Dioscorea* sp.).

In Sitio Pakpak Banog, Barangay Lincud, the vegetation type in the study plots belonged to a brushland-grassland and partly marshy land. The marshland portion was an extension of Jalaur river with only two species of aquatic macrophytes identified, namely subsuban

(*Polygonum barbatum*) and kangkong (*Ipomoea aquatica*), although bangkal (*Nauclea orientalis*) were also sparsely scattered along the banks. The grassland that bordered the river bank was dominated by Family Poaceae such as carabao grass (*Paspalum conjugatum*) and amorseco (*Chrysopogon aciculatus*) and Cyperaceae such as burobutones (*Cyperus kyllingia*), and mutha (*Cyperus rotundus*) as evidenced by their numerical abundance.

A clump of kawayan tinik (*Bambusa blumeana*) was recorded although more inhabited the foothills adjacent to the sampling plots. Small trees and shrubs species that dominated the hill slopes were coffee (*Coffea* sp.), badlan (*Radermachera sibuyanensis*), alipung (*Gmelina philippensis*), niog-niogan (*Ficus pseudopalma*) and pakiling (*Ficus odorata*). A composite inventory of vascular plants captured in the sampling plot that were established in the riverine of Sitio Tina, Barangay Moroboro and Sitio Pakpak Banog, Barangay Lincud (Table 8) together with their composite relative density (n*i*), species richness (S), and diversity index value (H') shows that altogether there were 137 plant species identified distributed in 110 genera and 54 families. The riverine site has a higher (H'=3.30) diversity index than the protected forest ecosystem (H'=2.69) although both ecosystems registered a moderate diversity index level (Table 9).

Table 7.

*Composite inventory of vascular plants present inside the sampling plots established along Guiso Cave Trail representing the protected forest ecosystem of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.**

Local/Common Name	Scientific Name	Family	ni N=7,007	Pi 1.0000	H′ H′ = 2.69
Agpoi / Angel wing	*Bauhinia integrifolia*	Caesalpinaceae	64	0.009166	-0.04290
Alagao	*Premna odorata*	Verbenaceae	02	0.000287	- 0.00228
Alahan	*Guioa koelreuteria*	Sapindaceae	30	0.004296	- 0.02338
Alangingi	*Cayratia trifolia*	Vitaceae	05	0.000716	- 0.00519
Alas-as	*Pandanus luzonensis*	Pandanaceae	09	0.001289	- 0.00858
Albutra	*Arcangelisia flava*	Menispermaceae	57	0.008164	-0.03925
Alim	*Melanolepis multiglandulosa*	Euphorbiaceae	01	0.000143	- 0.00127
Alipung	*Gmelina philippensis*	Verbenaceae	02	0.000287	-0.00228
Amamali	*Leea aculeata*	Leeaceae	08	0.001146	-0.00776
Amugis	*Koordersiodendron pinnatum*	Anacardiaceae	12	0.001719	-0.01138
Anagas	*Semecarpus elmeri*	Anacardiaceae	06	0.000859	-0.00606
Anonang	*Cordia dichotoma*	Boraginaceae	01	0.000143	-0.00127
Antipolo	*Artocarpus blancoi*	Moraceae	02	0.000287	-0.0.0023
Antol	*Anacardium* sp.	Anacardiaceae	04	0.000573	-0.00043
Anubing	*Artocapus ovatus*	Moraceae	02	0.000287	-0.00228
Aplas	*Ficus irisana*	Moraceae	04	0.005729	-0.00428
Arangen	*Ganophyllum falcatum*	Sapindaceae	03	0.000429	-0.00338
Asin-asin	*Annona* sp.	Annonaceae	04	0.000429	-0.00428
Ayo	*Tetrastigma harmandii*	Vitaceae	06	0.000859	-0.00606
Bagauak	*Clerodendrom minahassae*	Verbenaceae	05	0.000716	-0.00519
Bahai	*Ormosia calavensis*	Papilionaceae	03	0.000429	-0.00338
Bakan	*Litsea perrottetii*	Lauraceae	19	0.002721	-0.01607
Balinghasai	*Buchanania arborescencs*	Anacardiaceae	02	0.000287	-0.00228

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Local/Common Name	Scientific Name	Family	ni N=7,007	Pi 1.0000	H′ H′ = 2.69
Baling-uai	*Flagellaria indica*	Flagillariaceae	32	0.004583	-0.02468
Balit / Barit (Pn)	*Erioglossum rubiginosum*	Sapindaceae	20	0.002865	-0.01677
Banag	*Smilax bracteata*	Liliaceae	01	0.000193	-0.00127
Banai-banai	*Radermachera pinnata*	Bignoniaceae	04	0.000573	-0.00428
Banato	*Mallotus philippensis*	Euphorbiaceae	22	0.003151	-0.01815
Banawak	*Uvaria rubra*	Annonaceae	02	0.000287	-0.00228
Banilad	*Sterculia comosa*	Sterculiaceae	01	0.000143	-0.00127
Bari-bari	*Saurauia* sp.	Actinidiaceae	54	0.007730	-0.03760
Batino	*Alstonia macrophylla*	Araliaceae	03	0.000429	-0.00338
Bato-bato babae	*Xantophyllum flasvescens*	Polygalaceae	04	0.000572	-0.00428
Bayanti	*Mallotus paniculatus*	Euphorbiaceae	01	0.000143	-0.00127
Bayok	*Pterospermum diversifolium*	Sterculiaceae	06	0.000859	-0.00607
Bayok-bayokan	*Pterospemum celebicum*	Sterculiaceae	01	0.000143	-0.00127
Bignay	*Antidesma bunius*	Euphorbiaceae	07	0.001003	-0.00692
Bignay pugo	*Antidesma pentandrum.*	Euphorbiaceae	07	0.001003	-0.00692
Biriba	*Rollinia deliciosa*	Annonaceae	03	0.004296	-0/00338
Bitaog	*Calophyllum inophyllum*	Clusiaceae	01	0.000134	-0.00127
Blue ginger	*Globba* sp.	Zingiberaceae	193	0.027643	-0.09920
Bongo-og	*Vitex glabrata*	Lamiaceae	01	0.000143	-0.00127
Buko-buko	*Blechum brownei*	Acanthaceae	04	0.000573	-0.00428
Burakan	*Merremia peltata*	Convolvulaceae	04	0.000573	-0.00428
Burubanati	*Murraya* sp.	Rutaceae	03	0.004296	-0.00338
Buyo-buyo	*Piper abbreviatum*	Piperaceae	01	0.000134	-0.00127

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Table 7. (Continued...)

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Local/Common Name	Scientific Name	Family	ni N=7,007	Pi 1.0000	H′ H′ = 2.69
Climbing bamboo	*Dinochloa scandens*	Poaceae	28	0.004010	-0.02213
Dalunot	*Pipturus arborescens*	Urticaceae	02	0.000287	-0.00228
Diliwariw	*Acanthus ilecifolius*	Acanthaceae	269	0.038527	-0.12546
Duklitan	Pouteria duclitan	Sapotaceae	10	0.001432	-0.00938
Dulit	*Canarium hirsutum*	Burseraceae	25	0.003580	-0.03267
Green arrow alocasia	*Alocasia* sp.	Araceae	136	0.005156	-0.07670
Hagnaya	*Polygala venenosa*	Polygalaceae	06	0.000859	-0.00606
Igyo	*Dysoxylum decandrum*	Meliaceae	07	0.001003	-0.00692
Kahoy dalaga	*Mussaenda philippica*	Rubiaceae	04	0.000573	-0.00428
Kaikal	*Adiantum philippense*	Adiantaceae	1,480	0..211974	-0.32883
Kaliantan	*Leea philippinensis*	Leeaceae	03	0.004297	-0.00338
Kalios	*Streblus asper*	Moraceae	05	0.000716	-0.00127
Kamagong	*Diospyros philippensis*	Ebenaceae	03	0.004296	-0.00338
Kamia	*Hedychium coronarium*	Zingiberaceae	458	0.065597	-0.17868
Kamingi/Batikuling	*Dacryodes incurvata*	Burseraceae	01	0.000134	-0.00127
Kamuning	*Murraya paniculata*	Rutaceae	02	0.000287	-0.00228
Kangko	*Aphanamixis polystachya*	Meliaceae	09	0.001289	-0.00855
Kape	*Coffea robusta*	Rubiaceae	824	0.118018	-0.02522
Kape-kape	*Randia umbellata*	Rubiaceae	05	0.000716	-0.00519
Karaksan	*Linociera ramiflora*	Oleaceae	13	0.001862	-0.01170
Kayos/ Nami	*Dioscorea hispida*	Dioscoreaceae	05	0.000716	-0.00519
Kulatingan	*Pterospermum obliquum*	Sterculiaceae	02	0.000287	-0.00228
Kupang	*Parkia timoriana*	Mimosaceae	04	0.000573	-0.00428

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Local/Common Name	Scientific Name	Family	ni N=7,007	Pi 1.0000	H′ H′ = 2.69
Lagtang	*Anamirta cocculus*	Menispermacea	06	0.000859	-0.00606
Langkauas	*Zingiber zerumbet*	Zingiberaceae	02	0.000287	-0.00228
Laniti	*Wrigthia pubescens*	Apocynaceae	06	0.000859	-0.00606
Laniting gubat	*Kibatalia blancoi*	Apocynaceae	02	0.000287	-0.00228
Lanutan	*Miliusa vidalii*	Annonaceae	02	0.000287	-0.00228
Large leaf mahogany	*Swietenia macrophylla*	Meliaceae	06	0.000859	-0.00606
Libas	*Spondias pinnata*	Anacardiaceae	02	0.000287	-0.00228
Lipang kalabaw	*Laportea meyeniana*	Urticaceae	11	0.001576	-0.01017
Lunas /Sawi	*Lunasia* sp.	Rutaceae	07	0.001003	-0.00692
Malaikmo	*Celtis philippensis*	Celtidaceae	04	0.000573	-0.00428
Malapingan	*Trichadenia philippinensis*	Flacourtiaceae	03	0.004296	-0.00338
Malugai	*Pometia pinnata*	Sapindaceae	11	0.001576	-0.01017
Marakape	*Fragreae racemosa*	Loganiaceae	03	0.004296	-0/00338
Monstera	*Monstera* sp.	Araceae	01	0.000143	-0.00127
Narra	*Pterocarpus indicus*	Papilionaceae	21	0.003308	-0.01746
Nato	*Palaquim luzoniense*	Sapotaceae	02	0.000287	-0.00228
Niog-niogan	*Ficus pseudopalma*	Moraceae	11	0.001576	-0.01017
Nitong puti	*Lygodium circinatum*	Schizaesaceae	32	0.004583	-0.02468
Oak-leaf fern	*Drynaria quercifolia*	Polypodiaceae	202	0.028932	-0.10249
Pagsahingin	*Canarium asperum*	Burseraceae	13	0.001862	-0.01170
Pagsahingin bulog	*Canarium calophyllum*	Burseraceae	07	0.001003	-0.00692
Paguringon	*Cratoxylum sumatranum*	Hypericaceae	14	0.002005	-0.01246
Pakiling	*Ficus odorata*	Moraceae	03	0.004296	-0.00338

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Table 7. (Continued...)

*Composite inventory of vascular plants present inside the sampling plots established along Guiso Cave Trail representing the protected forest ecosystem of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.**

Local/Common Name	Scientific Name	Family	ni N=7,007	Pi 1.0000	H′ H′ = 2.69
Pako fern	*Diplazinium esculentum*	Dryopteridaceae	01	0.000134	-0.00127
Palosanto	*Triplaris cumingiana*	Polygonaceae	1739	0.024907	-0.34621
Pandakaki	*Tabernaemontana pandacaqui*	Apocynaceae	17	0.002435	-0.01468
Patolang uwak	*Momordica* sp.	Cucurbitaceae	02	0.000287	-0.00228
Pildes	*Garcinia dives*	Clusiaceae	08	0.001146	-0.00776
Pingka-pinkahan	*Oroxylum indicum*	Bignoniaceae	16	0.002291	-0.01393
Pinya	*Ananas* sp.	Bromelliaceae	13	0.001862	-0.01171
Pungapong	*Amorphophallus paeoniifolius*	Araceae	18	0.002578	-0.01537
Pungsod	*Sapindus* sp.	Sapindaceae	03	0.0004296	-0.00038
Puso-puso	*Neolitsea vidalii*	Lauraceae	03	0.004296	-0.00338
Red lauan	*Shorea negrosensis*	Dipterocarpaceae	02	0.000287	-0.00228
Sablot	*Litsea glutinosa*	Lauraceae	18	0.002578	-0.01537
Saling uwak	*Clerodendron quadriculare*	Verbenaceae	03	0.004296	-0/00338
Salingogon	*Cratoxylum formosum*	Clusiaceae	02	0.000287	-0.00228
Sampinit	*Caesalpinia nuga*	Caesalpinaceae	02	0.000287	-0.00228
San Francisco	*Codieaum variegatum*	Euphorbiaceae	67	0.009590	-0.04459
Sibulao	*Glochidion* sp.	Euphorbiaceae	14	0.002005	-0.01246
Silver leaf fern	*Pityrogramma calomelanos*	Adiantaceae	01	0.000143	-0.00127
Stepladder	*Catimbium speciosum*	Zingiberaceae	26	0.003724	-0.02083
Tabhisan	*Talauma reticulata*	Magnoliaceae	05	0.000143	-0.00127
Taguang –uwak	*Croton leiophyllus*	Euphorbiaceae	08	0.001146	-0.00776
Taluto	*Pterocymbium tinctorium*	Sterculiaceae	193	0.027642	-0.09919
Tamayuan	*Strombosia philippinensis*	Oleacaceae	04	0.000573	-0.00428

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Table 7. (Continued...)

*Composite inventory of vascular plants present inside the sampling plots established along Guiso Cave Trail representing the protected forest ecosystem of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.**

Local/Common Name	Scientific Name	Family	ni N=7,007	Pi 1.0000	H′ H′ = 2.69
Taquipan	*Karyota cumingii*	Arecaceae	210	0.003002	-0.01746
Tibig	*Ficus nota*	Moraceae	01	0.000143	-0.00127
Tiger aglaonema	*Aglaonema* sp.	Araceae	188	0.026926	-0.09733
Tola-tola	*Mallotus lackeyi*	Euphorbiaceae	03	0.004296	-0.00333
Toothed philodendron	*Philodendron lacerum*	Araceae	14	0.002005	-0.01246
Tugis	*Alpinia brevilabris*	Zingiberaceae	03	0.004296	-0.00338
Tuka	*Wikstroemia lanceolata*	Thymelaeaceae	02	0.000287	-0.00228
Tulibastilos	*Micromelum minutum*	Rutaceae	40	0.005729	-0.02957
Uvaria /susong kalabaw	*Uvaria rufa*	Annonaceae	14	0.002005	-0.01246
Wood fern	*Christella parasitica*	Thylepteridaceae	52	0.007445	-0.03648
			N=7,007	**1.0000**	**H′ = 2.69**
		Plant density / m^2 (800m^2 plot size)	**8.75 /m^2**		
		No. of species /m^2 (800m^2 plot size)	**0.16**	**very low**	

*The taxa are arranged alphabetically with their family, relative density (ni), relative abundance (Pi), and diversity index (H').

Table 8.

*Composite inventory of vascular plants present inside the sampling plots established in Sitio Tina, Barangay Moroboro and Sitio Pakpak Banog, Barangay Lincud representing the riverine ecosystem of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.**

Local/Common Name	Scientific Name	Family	ni N=43,466	Pi 1.00000	H′ H′ = 3.3033
African Oil Palm	*Elaeis guineensis*	Arecaceae	01	-0.000023	-0.00025
Alagao/Adgao	*Premna odorata*	Verbenaceae	06	-0.000014	-0.00012
Alim	*Melanolepis multiglandulosa*	Euphorbiacaee	01	-0.000023	-0.00025
Alipung/Gmelina	*Gmelina philippensis*	Verbenaceae	38	-0.000874	-0.00260
Amamali	*Leea aculeata*	Leeaceae	11	-0.000253	-0.00210
Amorseco/Barire	*Chrysopogon aciculatus*	Poaceae	44	-0.001012	-0.00697
Anagas	*Semecarpus elmeri*	Anacardiaceae	17	-0.000391	-0.00710
Anahaw	*Livistona rotundifolia*	Arecaceae	04	-0.000092	-0.00090
Avocado	*Litsea glutinosa*	Lauraceae	02	-0.000046	-0.00050
Badlan	*Radermachera sibuyanensis*	Bignoniaceae	67	-0.001541	-0.00990
Bagauak	*Clerodendron minahassae*	Lamiacea	04	-0.000092	-0.00090
Balinghasai	*Buchanania arborescens*	Anacardiaceae	12	-0.000276	-0.00230
Baludgangan	*Digitaria setigera*	Poacea	172	-0.003957	-0.02190
Banana (sab-a)	*Musa paradisiaca*	Musaceae	12	-0.000276	-0.00230
Banato	*Mallotus philippensis*	Euphorbiaceae	04	-0.000092	-0.00090
Bangkal	*Nauclea orientalis*	Rubiaceae	21	-0.000483	-0.00040
Bayabas	*Psidium guajava*	Myrtaceae	05	-0.000115	-0.00100
Bayanti	*Mallotus paniculatus*	Euphorbiaceae	01	-0.000023	-0.00025
Bayok	*Pterospermum diversifolium*	Sterculiaceae	01	-0.000023	-0.00025
Bermuda grass	*Cynodon dactylon*	Poaceae	855	-0.01967	-0.07730
Bignai	*Antidesma bunius*	Euphorbiaceae	07	-0.000161	-0.00010

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Table 8. (Continued...)

*Composite inventory of vascular plants present inside the sampling plots established in Sitio Tina, Barangay Moroboro and Sitio Pakpak Banog, Barangay Lincud representing the riverine ecosystem of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.**

Local/Common Name	Scientific Name	Family	ni N=43,466	Pi 1.00000	H′ H′ = 3.3033
Bika	*Ampelocissus martini*	Vitaceae	20	-0.00046	-0.00040
Binunga	*Macaranga tanarius*	Euphorbiaceae	05	-0.000115	-0.00100
Biriba	*Rollinia deliciosa*	Annonaceae	02	-0.000046	-0.00050
Bitongol	*Flacourtia rukam*	Flacourtiaceae	01	-0.000023	-0.00025
Boerhavia	*Boerhaavia erecta*	Nyctaginaceae	05	-0.000115	-0.00100
Bongo-og	*Vitex glabrata*	Lamiaceae	02	-0.000046	-0.00050
Borreria	*Borreria laevis*	Rubiaceae	21	-0.000483	-0.00040
Bunga	*Areca catechu*	Arecaceae	04	-0.000092	-0.00090
Bungot-bungot	*Fimbristylis miliacea*	Cyperaceae	86	-0.001978	-0.01230
Buntot kapon	*Pteris mutilata*	Pteridaceae	03	-0.000069	-0.00070
Burakan	*Merremia similis*	Convolvulaceae	40	-0.00092	-0.00640
Buri	*Corypha utan*	Arecaceae	01	-0.000023	-0.00025
Burobotones	*Cyperus kyllingia*	Cyperaceae	12,084	-0.278010	-0.35590
Calamansi	*Citrus mitis*	Rutaceae	02	-0.000046	-0.00050
Camachille	*Pithecelobium dulce*	Mimosaceae	01	-0.000023	-0.00025
Carabao grass	*Paspalum conjugatum*	Poaceae	10,275	-0.236390	-0.34170
Cauit-cauitan	*Cenchrus echinatus*	Poaceae	22	-0.000506	-0.00380
Centrosema	*Centrosema pubescens*	Papilionaceae	579	-0.013320.	-0.05750
Chico	*Manilkara zapota*	Sapotaceae	14	-0.000322	-0.00026
Climbing bamboo	*Dinochloa scandens*	Poaceae	126	-0.00289	-0.01690
Cogon	*Imperata cylindrica*	Poaceae	5,048	-0.116136	-0.25000

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Table 8. (Continued...)

*Composite inventory of vascular plants present inside the sampling plots established in Sitio Tina, Barangay Moroboro and Sitio Pakpak Banog, Barangay Lincud representing the riverine ecosystem of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.**

Local/Common Name	Scientific Name	Family	ni N=43,466	Pi 1.00000	H′ H′ = 3.3033
Common Sword fern	*Nephrolepis cordifolia*	Oleandraceae	148	-0.003405	-0.01930
Coronitas	*Lantana camara*	Verbenaceae	36	-0.000828	-0.00590
Dalugdug/Singwelan	*Caesalpina crista*	Caesalpinaceae	03	-0.000069	-0.00070
Dalunot	*Pipturus arborescens*	Urticaceae	13	-0.000299	-0.00240
Dapong kahoy	*Scurrula philippensis*	Loranthaceae	06	-0.000014	-0.00012
Dilang aso	*Pseudoelephantopus spicatus*	Asteraceae	77	-0.001770	-0.01120
Dilang baka	*Elephantopus tomentosus*	Asteraceae	10	-0.000230	-0.00190
Diluwariw	*Acanthus ilecifolius*	Acanthaceae	01	-0.000023	-0.00025
Dioscorea	*Dioscorea* sp.	Dioscoriaceae	30	-0.000690	-0.00510
Dischidia	*Dischidia* sp.	Asclepiadaceae	04	-0.000092	-0.00090
Ground orchid	*Habenaria* sp.	Orchidaceae	03	-0.000069	-0.00070
Hagonoy	*Chromolaena odorata*	Asteraceae	1,342	-0.030870	-0.10740
Halos	*Digitaria ciliaris*	Poaceae	637	-0.014650	-0.06190
Hauli	*Ficus septica*	Moraceae	04	-0.000092	-0.00090
Igyo	*Dysoxylum gaudichaudianum*	Meliaceae	19	-0.000437	-0.00340
Ipil-ipil	*Leucaena leucocephala*	Mimosaceae	35	-0.000800	-0.00057
Isis	*Ficus ulmifolia*	Moraceae	05	-0.000115	-0.00100
Kabkab/Lukot lukot	*Drynaria quercifolia*	Polypodiaceae	32	-0.000730	-0.00530
Kahoy dalaga/Agboi	*Mussaenda philipicca*	Rubiaceae	11	-0.000253	-0.00210
Kakawati	*Gliricidia sepium*	Papilionaceae	13	-0.000299	-0.00240
Kalios	*Streblus asper*	Moraceae	10	-0.000230	-0.00190

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Table 8. (Continued...)

*Composite inventory of vascular plants present inside the sampling plots established in Sitio Tina, Barangay Moroboro and Sitio Pakpak Banog, Barangay Lincud representing the riverine ecosystem of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.**

Local/Common Name	Scientific Name	Family	ni N=43,466	Pi 1.00000	H′ H′ = 3.3033
Kaliskis kalabaw	*Desmodium* sp.	Papilionaceae	144	-0.003313	-0.01880
Kaliskis dalag	*Desmodium triflorum*	Papilionaceae	1,585	-0.036460	-0.12070
Kalubay	*Lagenaria siceraria*	Convolvulaceae	01	-0.000023	-0.00025
Kalukoi	*Ficus callosa*	Moraceae	03	-0.000069	-0.00070
Kamoteng Kahoy	*Manihot esculenta*	Euphorbiacae	04	-0.000092	-0.00090
Kamuning	*Murraya paniculata*	Rutaceae	01	-0.000023	-0.00025
Kangkong	*Ipomoeae aquatica*	Convolvulaceae	35	-0.000805	-0.05740
Kape	*Coffea robusta*	Rubiaceae	77	-0.001770	-0.01121
Karaksan	*Linociera ramiflora*	Oleaceae	05	-0.000115	-0.00100
Kawayan tinik	*Bambusa blumeana*	Poaceae	34	-0.000780	-0.00560
Kayos /Nami	*Dioscorea hispida*	Dioscoriaceae	09	-0.000207	-0.00180
Kollo-kollot	*Urena lobata*	Malvaceae	02	-0.000046	-0.00050
Kurukauayan	*Leptochloa chinensis*	Poaceae	4,258	-0.097960	-0.22750
Langka	*Artocarpus heterophyllus*	Moraceae	02	-0.000046	-0.00050
Langkauas	*Zingiber zerumbet*	Zingiberaceae	379	-0.008719	-0.04130
Lanite	*Wrigthia pubescens*	Apocynaceae	01	-0.000023	-0.000250
Large leaf Mahogany	*Swietenia macrophylla*	Meliaceae	81	-0.001860	-0.01170
Libas	*Spondias pinnata*	Anacardiaceae	02	-0.000046	-0.00050
Limonsito	*Triphasia trifolia*	Rutaceae	01	-0.000023	-0.00025
Lisak	*Neonauclea bartlingii*	Rubiaceae	01	-0.000023	-0.00025
Makahiya	*Mimosa pudica*	Mimosaceae	339	-0.007799	-0.03780

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Table 8. (Continued...)

*Composite inventory of vascular plants present inside the sampling plots established in Sitio Tina, Barangay Moroboro and Sitio Pakpak Banog, Barangay Lincud representing the riverine ecosystem of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.**

Local/Common Name	Scientific Name	Family	ni N=43,466	Pi 1.00000	H′ H′ = 3.3033
Makahiyang lalake	*Biophytum sensitivum*	Mimosaceae	04	-.0000920	-0.00090
Malaikmo	*Celtis philippensis*	Celtidaceae	44	-0.000101	-0.00690
Malapapaya	*Polyscias nodosa*	Araliaceae	03	-0.000069	-0.00070
Malapingan	*Trichadenia philippinensis*	Flacourtiaceae	14	-0.000322	-0.00026
Malugai	*Pometia pinnata*	Sapindaceae	31	-0.000713	-0.00520
Mango (Indian)	*Mangifera indica*	Anacardiaceae	04	-0.000092	-0.00090
Morning glory	*Ipomoea triloba*	Convolvulaceae	05	-0.000115	-0.00100
Mungo-mungo	*Calopogonium muconoides*	Papilionaceae	44	-0.000101	-0.00690
Mutha / Sudsud	*Cyperus rotundus*	Cyperaceae	1551	-0.035680	-0.11890
Nino /Bankudo	*Morinda citrifolia*	Rubiaceae	01	-0.000069	-0.00070
Niog	*Cocos nucifera*	Arecaceae	05	-0.000115	-0.00100
Niog-niogan	*Ficus pseudopalma*	Moraceae	127	-0.002920	-0.01700
Nito	*Lygodium flexousom*	Schizaeaceae	05	-0.000115	-0.00100
Nitong parang	*Lygodium microphyllum*	Schizaeaceae	04	-0.000092	-0.00090
Nitong Puti	*Lygodium circinnatum*	Schizaeaceae	21	-0.000483	-0.00370
Oyampong	*Ipomoea triloba*	Convolvulaceae	02	-0.000046	-0.00050
Paguringon	*Cratoxylum sumatranum*	Hypericaceae	13	-0.000299	-0.00240
Pakiling	*Ficus odorata*	Moraceae	28	-0.000644	-0.00470
Palawan gabi	*Cyrtosperma merkusii*	Araceae	07	-0.00016	-0.00140
Payang-payang	*Desmodium pulchellum*	Papilionaceae	03	-0.000069	-0.00070
Pteris	*Pteris* sp.	Pteridaceae	52	-0.001196	-0.00800

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Table 8. (Continued...)

*Composite inventory of vascular plants present inside the sampling plots established in Sitio Tina, Barangay Moroboro and Sitio Pakpak Banog, Barangay Lincud representing the riverine ecosystem of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.**

Local/Common Name	Scientific Name	Family	ni N=43,466	Pi 1.00000	H′ H′ = 3.3033
Pugo-pugo	*Cyperus brevifolius*	Cyperaceae	33	-0.000759	-0.00550
Pungsod	*Sapindus* sp.	Sapindaceae	03	-0004296	-0.00338
Puso-puso	*Neolitsea vidalii*	Lauraceae	01	-0.000069	-0.00070
Rambutan	*Nephelium lappaceum*	Sapindaceae	01	-0.000069	-0.00070
Sablot	*Litsea glutinosa*	Lauraceae	13	-0.000299	-0.00240
Salingogon	*Cratoxylum formosum*	Clusiaceae	01	-0.000069	-0.00070
San Pedro	*Phyllanthus niruri*	Phyllanthaceae	03	-0.000069	-0.00070
Sibukaw	*Caesalpinia sappan*	Caesalpinaceae	96	-0.002208	-0.01350
Silver leaf fern	*Pityrogramma calomelanos*	Adiantaceae	01	-0.000069	-0.00070
Singilan	*Ageratum conyzoides*	Asteraceae	05	-0.000115	-0.00100
Sintimento	*Stachytarpheta jamaicensis*	Verbenaceae	02	-0.000046	-0.00050
Subsuban (Tag.)	*Polygonum barbatum*	Polygonaceae	1,302	-0.029950	-0.10510
Takinis	*Ficus cumingii*	Moraceae	07	-0.000160	-0.00140
Takip asin	*Macaranga grandiflora*	Euphorbiaceae	02	-0.000046	-0.00050
Takling baka	*Sida rhombifolia*	Malvaceae	02	-0.000046	-0.00050
Taluto	*Pterocymbium tinctorium*	Sterculiaceae	04	-0.000092	-0.00090
Tangarihas puru	*Pteris cretica*	Pteridaceae	10	-0.000230	-0.00193
Tangisang bayawak	*Ficus variegata*	Moraceae	20	- 0.000460	-0.00353
Tangisang- layagan	*Ficus latsoni*	Moraceae	02	-0.000046	-0.00050
Taquipan/Fish Tail palm	*Karyota cumingii*	Arecaceae	02	-0.000046	-0.00646
Tayok-tayok / Mutha	*Fimbrisylis dichotoma*	Cyperacaea	74	-0.001790	-0.01084

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Table 8. (Continued...)

*Composite inventory of vascular plants present inside the sampling plots established in Sitio Tina, Barangay Moroboro and Sitio Pakpak Banog, Barangay Lincud representing the riverine ecosystem of Bulabog-Putian Natural Park, Dingle, Iloilo, Philippines.**

Local/Common Name	Scientific Name	Family	ni N=43,466	Pi 1.00000	H′ H′ = 3.3033
Teramycin	*Ficus* sp.	Moraceae	16	-0.000368	-0.00291
Tigaw	*Callicarpa* sp.	Verbenaceae	02	-0.000046	-0.00646
Tsang gubat/ bugtot tae	*Carmona retusa*	Boraginaceae	40	-0.00092	-0.00643
Tubak tuba/ Beggarticks	*Bidens* sp.	Asteraceae	666	-0.015320	-0.06401
Tubli	*Derris elliptica*	Papilionaceae	01	-0.000069	-0.00070
Tuka	*Wikstroemia lanceolata*	Thymelaeaceae	02	-0.000046	-0.00646
Tulibas tilos	*Micromelum minutum*	Rutaceae	06	-0.000138	-0.00123
Uvaria/Susong Kalabao	*Uvaria rufa*	Annonaceae	03	-0.000069	-0.00070
Walis-walisan	*Sida retusa*	Malvaceae	10	-0.000230	-0.00193
Wood fern	*Christella parasitica*	Thylepteridaceae	103	-0.002369	-0.01385
Yam	*Dioscorea alata*	Dioscoreaceae	99	-0.002277	-0.91385
Yemane/Gmelina	*Gmelina arborea*	Verbenaceae	25	-0.000575	-0.00429
			N=43,466	**1.00000**	**H′=3.3033**
		Plant density /m² (800m² plot size)	**54.33**		
		No. of species /m²(800m² plot size)	**0.17**	**very low**	

*The taxa are arranged alphabetically with their family, relative density (ni), relative abundance (Pi) and diversity index (H'). N= Total number of individuals in the 8 quadrats along a 200-m transect

DISCUSSION AND CONCLUSION

Macrofloral diversity of the protected forest ecosystem and the riverine ecosystem of BPNP was assessed and compared. The riverine ecosystem recorded a higher species richness (S=137) than the protected forest ecosystem (S=126). this can be attributed to the presence of invading weed species in the open lands under cultivation and in the grassland portion that harbor the highly prolific and sun-loving grasses such as carabao grass (*P. conjugatum*), buko-buko (*C. dactylon*), cogon (*I. cylindrica*), and kurukawayan (*L. chinensis*); sedges such as burubotones (*C. kyllingia*) and mutha (*C. rotundus*); and some broadleaves such as kaliskis dalag (*D. triflorum*), hagonoy (*C. odorata*) and tubak tuba (*Bidens* sp.), among others that have contributed to the enormous numerical abundance (N=43,466) in the entire riverine ecosystem compared to the protected forest ecosystem (N=7,007).

The riverine ecosystem appears to be fragmented because it is a combination of grassland, brushland, and marshland along with agroforestry areas especially planted to chico, coffee, and large leaf mahogany. Two original dipterocarps of timber quality still exist in the protected forest ecosystem, namely red lauan (*S. negrosensis*) and white lauan (*S. contorta*); however, only red lauan was captured in the sampling plot as saplings. There is a need to mass propagate these species both in the nursery and in the wild as they now are treated as critically endangered species together with kamagong (*D. philippensis*) and prickly narra (*P.indicus forma echinatus*).

Likewise, an equal protection and conservation strategy should be extended to vulnerable species: amugis (*K. pinnatum*), antipolo (*A. blancoi*), is-is (*F. ulmifolia*), niyog-niyogan (*F. pseudopalma*), and yemane (*G. arborea*); the depleted species anonang (*C. dichotoma*), malugai (*P. pinnata*), and the rare or vulnerable taluto (*P. tinctorium*), a monotypic, native tree genus in a secondary forest (Gruezo, 2009; Gallaza, 2009). Other noteworthy species were amamali (*L. philippinensis*), kahoy dalaga (*M. philippica*), ayo (*T. loheri*), and anagas (*S. elmeri*). Shannon-Weiner Diversity Index calculations for the protected forest ecosystem (H'=2.69) and riverine ecosystem (H'=3.30) showed that both ecosystems have moderate plant diversity level (Table 9).

The prevailing major threats to BPNP biodiversity include influx of visitors, minor forest products extraction, land clearing, and intermittent but selective illegal cutting of mature trees.

Table 9.

*Shannon-Weiner Index of Diversity**

Calculated S-W DI	Description
0.00 – 1.66	Low level of plant diversity
1.66 – 3.33	Moderate level of plant diversity
3.33 – 5.00	High level of plant diversity

*The higher the H' value, the higher is the species diversity of the site, with 5 as the highest.

RECOMMENDATIONS

Based on the overall assessment of the macrofloral diversity of BPNP, the researchers forward the following recommendations:

1. For environmental security, local and national government agencies must implement a stringent policy on CPR (Conserve, Protect, Rehabilitate): [a] Conservation and protection of the existing plant species especially the endemic and indigenous plant species. There is a need to mass propagate some other species of high economic value but threatened and vulnerable and conserve ex situ, not only those commonly found in BPNP nursery such as mahogany and malugai; and [b] Rehabilitation or reforestation of areas depleted or denuded of plant species in order to attain a high level of plant diversity;
2. BPNP should be sustainably managed to achieve the full potential of this natural resource and being the only existing natural park in Iloilo Province which is now gaining momentum as one popular ecotourism destination; and
3. Promote ecotourism using the Bulabog-Putian Natural Park as a model to enhance environmental awareness among the people most especially on the role and impact of forest ecosystems to humans.

New Record. A potentially new plant species was discovered at Bulabog-Putian Park. Close-up photographs and key characters

of the species were referred to respected botanists. However, no confirmation of its identity was made. Dr. Williman Gruezo of UPLB (2010) placed it under family Annonaceae and identified it as Amuyon (*Goniothalamus amuyon*?) but this is unconfirmed. Dr. Alfredo Vendiville and Dr. Noe Gapas, both of the National Museum of the Philippines, and Forester Damaso Fuentes (2009) of DENR, Region 6 placed it under family Rubiaceae without specific identification but noted that it may belong to family Eleaocarpaceae. It was given a fancy name "Elefan Blue Marble" and local name "marakape" by the senior author. It is a potential ornamental plant especially for landscaping and *bonsai* (Figure 1).

Figure 1. "Elefan blue marble plant" showing the leaves in opposite arrangement, in florescence and its location, and the clustered fruits. Some fruits and seeds were dissected to reveal the anatomical features for characterization.

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