



A Preliminary Survey of Beach Forest Species in Guiuan Eastern Samar, Philippines: An Ethnobotanical Study

Joarth B. Sabulao¹, Joyce M. Magtolis^{1,2,*}, Catalina A. Capanang¹, Daisy E. Ingente¹, Mark Wendolf E. Paa¹, Ronaldo C. Hitosis Jr.¹, John Alvin Mabag¹ and Cyra C. Raga¹

¹Graduate School, Leyte Normal University, Tacloban City, Philippines

²College of Arts and Sciences, Leyte Normal University, Tacloban City, Philippines

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***Author for correspondence:**

Joyce M. Magtolis ✉ jbm.magtolis@gmail.com 📍 Graduate School, Leyte Normal University, Tacloban City, Philippines

Abstract

Objectives/methods: A preliminary ethnobotanical survey of beach forest species was conducted to identify the local names and document the uses of these resources to the locals of Guiuan, Eastern Samar, Philippines. Plants were identified *in situ* by an informant and samples were collected for herbarium specimen identification. Ethnobotanical data were obtained using a modified focused group (bench conference) and a semi-structured interview with each of the 15 informants, composed of a village leader, a local healer, and mostly elders. Quantitative data on the citation of beach plants per specific use were tabulated for frequency counts and percentage of informant's citation or agreement. **Findings/application:** The study documented at least 39 species of beach forests flora present in the community. The common uses of these species by the locals are associated with construction, source of income, food and food processing for humans and domesticated animals, fishing technology, insect repellent, home decors, and furniture, landscaping, and folk medicine. *Cocos nucifera* L. is evident in many applications in the life of the locals. Together with *Atipulo* (*Artocarpus blancoi*), and *Bagnaw* (*Premna odorata*), they were reported in diverse applications ranging from folk medicine to infrastructure and food preparation and consumption. Like any other ethnic group and underdeveloped communities in the world, medicinal administration is largely a symptomatic approach utilizing either fresh or dried leaves, fruits, roots, barks or even the whole plant across different preparations. The flexibility of some of these species in terms of utilization by the community can shed light on its abundance in the area and the associated local ecological knowledge. An ethnobotanical survey should be conducted across the Philippine archipelago for more comprehensive documentation of beach forest species, thereby giving cues on its dynamics and conservation efforts.

Keywords: Ethnobotany, Beach Forest Species, Descriptive Survey, Eastern Samar Ph.

1. Introduction

Beach forest is among the green fronts along the extensive 36,300 km long coastline of the Philippine archipelago [1]. It features a plant community growing along the sand dunes and rocks on sandy shores towards the high tidal zones, exposed to salt spray [2], strong wind, and drought [3]. This supratidal vegetation dominated by littoral creepers, shrubs, and trees provides a greenbelt that reduces the effect of strong winds, coastal erosion, and wave actions [4]. It fulfills vast ecological functions that generate natural resources and ecosystem services that sustain the local and the national economies as well. Accordingly, this becomes one strategic location for settlement since the olden days where most of the early civilizations begun. Recently, coastal areas are home to one-third of the world's human population with densities nearly three times that of the inland areas, increasing exponentially [5]. Considering the many uses of coastal vegetation, from traditional to industrial applications, people living primarily by fishing, do not need shifting places in search of food [6] and other requisites to fishing, cultural utility, and the rest for living [7]. Consequently, the long-term human population sustainability along these areas resulted in centuries of wanton exploitation leading to an alarming degradation that dooms to vanish.

Furthermore, the vulnerability of the Philippines to natural disasters such as earthquakes and tsunamis being along the Pacific Ring of Fire, and typhoons and storm surges being a tropical cyclone gateway from the Pacific Ocean, puts more pressure to the weakening defensive stance offered by the mangrove forest as the coasts the first line of defense. Mangrove cover in some towns in the province of Eastern Samar, Philippines has been in the decline since 1987–2016, which are accounted for the human activities in the area while aggravated by more frequent tropical cyclones [8]. The town of Balankayan alone had experienced a massive mangrove forest damage to 86 percent tree density and 68 percent basal area, brought about by the 2013 Supertyphoon Haiyan [9]. Furthermore [10] as cited by [9] considered a negligible storm surge strength reduction rate due to its narrow vegetation cover. This vulnerability and its substrate selectivity make matters worse in conferring protection to coastal communities, pressing the need for reinforcement of Beach Forest. This landward vegetation cover is not only efficient greenbelt, but its species are also naturally tolerant of sea spray, strong sunlight and dry conditions, making them ideal reforestation species for climate change adaptation [4].

However, unlike the extensively studied and funded coastal counterparts in mangroves [11], a little study is known to beach forests resulting in unfamiliarity to average Filipino ensuing dismal conservation efforts thereby losing unreported in the Philippine Forestry Statistics [4]. Worthy of note is the fact that along with this forest degradation and modernization of indigenous communities is the loss of a large undocumented repository of traditional knowledge and experiences donned by the local folks [12]. Therefore, understanding forest dynamics and local dependency provides a holistic view emphasizing the role of ethnoscientific approaches by integrating indigenous knowledge into contemporary frameworks for conservation and sustainable management of natural resources [13].

It is on this note that this study entitled, “A Preliminary Survey of Beach Forest Species in Guiuan Eastern Samar, Philippines: An Ethnobotanical Study,” was conceived. It aimed to a.) identify the local names of beach plant species, and to b.) document the uses of the beach forest species to the local folks in the study area.

2. Methodology

2.1. Study Site

The conduct of the study was at Sitio Comverse, Brgy. Ngolos, Guiuan, Eastern Samar (Figure 1), a coastal community bounded by the Pacific Ocean on the East, and the Leyte Gulf to the west (110 02'N 1250 44'E). A feeder road of 1 and a half kilometers along a mountainous terrain connects the secluded community to the provincial highway. Smooth pavements made the area accessible by any land vehicle or through a motorized and non-motorized boat if coursing through the sea. The land area is about 105 hectares, with an elevation estimated at 21.8 meters or 71.5 feet above mean sea level. It has 75 households (HH) with 60 HH into fishing while the rest are into farming and varied activities. Being laid along the eastern seaboard attributes to its rolling to flat topography. The article on

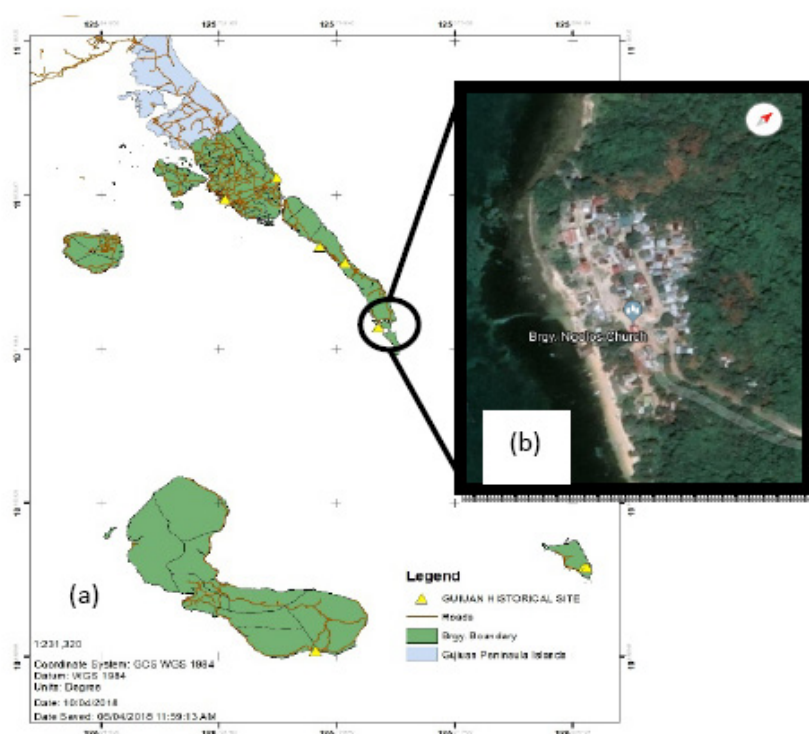


FIGURE 1. Study site: Maps of the Municipality of Guiuan (a) (source: Guiuan-CLUP, 200-2015) showing Sitio Comverse, Brgy. Ngolos, Guiuan, Eastern Samar (b) (source: Google Earth, 2019).

drought conditions and management strategies in the Philippines reported the area as having a climate Type II characterized by the absence of a dry season, but with a very pronounced maximum rain period from December to February [14] and an average annual rainfall of 3146.6 mm [15]. The area is rich with beach forest species and mangrove associates, which people utilize for different purposes. There is, however, the need to address conservation measures to ensure the continuity of the different species thriving in the coastal ecosystem more so is the fact that the site is part of the declared protected landscape/seascape in 1994 under the National Integrated Protected Areas System Act of 1992.

2.2. Plant Identification and Collection

The field study and interview was conducted during the months of November and December 2018 and in March 2019. Three (3) sets of 10 × 10 meters quadrat were randomly placed along the beach up to the high rocky segments of the coast to document the present species. Collected plants were identified in the field by one informant/guide who identified the local names, while morphology and habits were compared and verified through the book *Beach Forest Species and Mangrove Associates in the Philippines* [4]. Herbaria specimens with photographs of their habits were taken *in situ* for proper identification and deposited in the Leyte Normal University Herbarium.

2.3. Ethnobotanical Data Collection

An informed consent was given to the Local Government Unit and the informants before the start of the study. Data were collected from a series of site visits and interviews. A modified focused group called “bench conference” was held during the initial visit for brainstorming, while a guided tour with one of the highly familiar folks on the forest was made during the field survey for plant identification and collection. Furthermore, a series of semi-structured interviews on local name identification and uses were conducted with each of the informants. A total of fifteen (15) informants participated through referrals and volunteerism, ranging from 55 to 85 years of age coincidental to Voeks’s [16] notion that people acquire more knowledge with age. Selection of informants by gender was considered since some publications inferred that women tend to have a broader understanding in terms of medicinal plants than men [17] as attributed to their role in family health care in general, hence the pool of informants were composed mostly of females with nine (9). However, on a personal note, men tend to be more familiar with forest resources in terms of construction materials and wood collection for general use; hence six (6) male locals came out as referred by some participants. Furthermore, this pool of informants was composed of their lone local traditional healer, six fishers, and the rest being housewives.

2.4. Data Analysis

Results of the semi-structured interview, particularly on individual degree of familiarity and citation of beach plants per specific use, were tabulated for frequency counts and percentage of informant’s citation or agreement.

3. Results and Discussion

There were a total of thirty-nine (Table 1) beach forest species with ethnobotanical significance to the locals of Sitio Comverse, Brgy. Ngolos, Guiuan, Eastern Samar. Of the fifty-five identified beach forest species [4] found throughout the municipality of Guiuan, only 28 species were found in the area, while the rest of the 39 species are yet to be verified in different reputable herbaria. It implies a more intensive study on identification, species diversity and distribution in the area and the rest of the municipality.

TABLE 1. Summary of beach forest species, uses and informants' use citation.

Uses	Plant name		Informants' citation	
	Local name	Scientific name	Frequency	Percentage
1. Diseases/medical emergencies				
Antiseptic/ antibacterial	Maruk-barok	<i>Millettia pinnata</i>	6	40
Bleeding	Sibukaw		4	26.67
Bone fractures/sprain	Dalakit itom		5	33.33
Cancer/cyst	Turay		3	20
Hair/scalp	Lubi	<i>Cocos nucifera</i>	14	93.33
Jellyfish sting	Dalunutan		10	66.67
	Lambayong	<i>Ipomea pes-caprae</i>	9	60
	Malubago	<i>Talipariti tiliaceum</i>	9	60
	Nino	<i>Morinda citrifolia</i>	4	26.67
Post-partum	Malipagi		7	46.67
	Sibukaw		5	33.33
Skin diseases	Bagnaw	<i>Premna odorata</i>	8	53.33
	Dalunutan		14	93.33
	Maruk-baruk	<i>M. pinnata</i>	13	86.67
	Sunting	<i>Cassia alata</i>	2	13.33
2. Infrastructure				
Construction (house)	Anahaw	<i>Saribous rotundifolius</i>	9	
	An-an	<i>Alstonia macrophylla</i>	2	13.33
	Atipulo	<i>Artocarpus blancoi</i>	15	100
	Bagutwan		4	26.67
	Banahaw		1	6.67
	Banilad	<i>Stericulla futida</i>	7	46.67
	Banuyo	<i>Wallaceodendron celebicum</i>	14	93.33
	Bitu-on	<i>Barringtonia asiatica</i>	7	46.67
	Dalakit itom		2	13.33
	Hamurawon		2	13.33
	Kisiw		8	53.33
	Lubi	<i>C. nucifera</i>	15	100
	Talisay	<i>Terminalia catappa</i>	6	40
	Uto-utob	<i>Allophylus cobbe</i>	2	13.33
Boat making	Atipulo	<i>A. blancoi</i>	5	33.33
	Banagu	<i>Thespesia populnea</i>	13	86.67
	Malubago	<i>T. tiliaceum</i>	13	86.67

Wood fence/fish corals	Dapdap	<i>Erythrina variegata</i>	10	66.67
	Kisiw		14	93.33
	Lanete	<i>Wrightia pubescens</i>	1	6.67
		R. Br.		
	Nigad	<i>Glochidion littorale</i>	3	20
		Blume		
	Paitan		2	13.33
	Palalaso		3	20
	Salimbabangun		5	33.33
	Uto-utob	<i>A. cobbe</i>	4	26.67
Home decors/ landscaping furniture	Bantolinao	<i>Maba buxifolia</i>	15	100
	Harun	<i>Crinum asiaticum</i>	6	40
	Nito	<i>Lygodium</i>	13	86.67
		<i>circinnatum</i>		
3. Food source & processing				
Human food	Bagubatan		15	100
	Banilad tawo	<i>Stericulla ceramica</i>	2	13.33
	Lubi	<i>C. nucifera</i>	15	100
	Rimas	<i>Artocarpus camansi</i>	15	100
Animal feeds	An-an	<i>A. macrophylla</i>	2	13.33
	Banilad amo	<i>Stericulla futida</i>	8	53.33
	Bitu-on	<i>B. asiatica</i>	1	6.67
	Dalunutan		14	93.33
Ripening agent	Bagnaw	<i>P. odorata</i>	13	86.67
Food wrapping	Anahaw	<i>S. rotundifolius</i>	4	26.67
Firewood	Atipulo	<i>A. blancoi</i>	8	53.33
	Bituon	<i>B. asiatica</i>	12	80
	Lipata	<i>Cerbera odollam</i>	11	73.33
	Sunting	<i>C. alata</i>	6	40
4. Other uses				
Fish poison	Lagtang	<i>Anamirta cocculus</i>	14	93.33
	Panabulon	<i>Cerbera manghas</i>	6	40
	Tubli		1	6.67
Insect repellent	Bagnaw	<i>P. odorata</i>	11	73.33
Musical instrument	Lanete	<i>W. pubescens</i> R. Br.	2	13.33

The results of the interviews revealed that the identified plants are used in various ways of life by the locals as classified into different categories of applications such as treatment of diseases/medical emergencies, infrastructure, food and food processing, and other uses. There were 15 plants identified that are used in 7 different medicinal applications. Specifically, most of the informants mentioned both (93.33%) Lubi (*C. nucifera*), and Dalunutan as antiseptic/antibacterial and as a treatment for skin diseases, respectively. Like the Yaegl Aboriginal community [18], medicinal administration is mostly asymptomatic approach utilizing either fresh or dried leaves, fruits, roots, barks or even the whole plant across different preparations. The decoction is the most common preparation method employed, followed by a poultice. The locals have shared practices with some ethnobotany across the world in treating diseases or emergencies like using *Ipomea pes-caprae* (L.) R. Br. [2] with confirmed proteolytic and hemolytic neutralizing activity against jellyfish sting [19–20] albeit a different version of poultice preparation by chewing the leaves and applying to the affected area which is convenient given the urgency of the situation. Interestingly,

an anti-cancer reported in a plant named Turay which, according to the testimony of one informant from personal experience and word of mouth, has cured a family member cancer patient. Turay and the many species have associated pharmacological potentials stored in the local repository of knowledge while unknown, especially in the mainstream communities.

With a large beach forest cover surrounding the community, the locals have easy access to supplement their basic needs. In infrastructure, there were 25 species cited to be used in various construction purposes, from housing and fixtures and furniture to perimeter fencing and landscaping down to boat making and fish corrals (bunu-an). Explicitly, all informants agreed to use Lubi (*C. nucifera*) and Atipulo (*A. blancoi*) in building construction and fixtures with Banuyo (*W. celebicum*) being an excellent option (93.33%). Likewise, all participants agreed to use Bantolinao (*M. buxifolia*) for home decoration and landscaping purposes. An alternative to commercially available food crops and ingredients were 13 identified species used for human and animal consumption as well as food preparation such as fruit ripening, wrapping, and firewood. Again, Lubi together with Rimas (*A. camansi*) and Bagubatwan were used by all informants as food or ingredients in food preparations for human consumption, while most of them (93.33%) cited Dalunutan as an alternative feed to their livestock. As a fishing community, most of the informants mentioned the use of Lagtang (*A. cocculus*) in fish poisoning to improve the fish catch.

C. nucifera L., being coined as a “tree of life,” is evident in many applications in the life of the locals. Together with Atipulo, Bagnaw, and Dalunutan, these were reported in diverse applications (3 uses) ranging from treatment of diseases or medical emergencies to infrastructure and food or food preparations. The flexibility of some of these species in terms of utilization by the community can shed light on its abundance in the area and the associated local ecological knowledge. In subsequent publications cited by [21], they unanimously correlated species availability to selectivity in wood and non-wood forest product cutting and collection which thereby giving cues on its dynamics and conservation measures.

4. Conclusion

This study provided information on different local names and the ethnobotanical significance of beach forest species found in an isolated community in Guiuan, E. Samar, Philippines. Apparently, out of fifty-five identified species, there were thirty-nine species found to have associated significance to the locals in the area. This significance based on the utilization of these resources in the way of life, such as conventional medicine, infrastructure, food and food preparation, and the many other applications in their economic and social activities. The increasing influence of the mainstream communities and the threats to this resource degradation can lead to the disappearance of this valuable repository of knowledge, undocumented. Thus, preservation and integration of local indigenous knowledge is not only a culturally-sensitive but also a direct approach to sustainable conservation efforts.

4.1. Recommendation

It can be noted that some beach forest species were not identified based on scientific names and verified, hence further taxonomic studies and distribution are hereby needed. Studies on the bioactivity and phytochemical constituents are also recommended to give a scientific basis to their applications which will also give proper guidance to the locality regarding their practices.

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