SEAWEED RESOURCES IN THE ISLAND TOWN OF BIRI, NORTHERN SAMAR, PHILIPPINES

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ABSTRACT

This study aimed to identify the species composition and abundance of macro-seaweeds in the island town of Biri, Northern Samar, Philippines; determine their economic uses and point out the ethnobotanical practices related to seaweeds of the island people during the time of sampling. The study was conducted summer months of 2017-2018 in the four barangays; i.e. Sto. Nino (Palhugan), Progress (Kauswagan), San Antonio, and Poblacion. Methods used were quadrat sampling, transect walks, line intercept method, ocular inspection, interviews, and snorkeling (up to 1m depth*). Ulva lactuca* Lin. is the most abundant seaweed being found in all the sampling sites in large quantity. There were many Sargassum species collected (11 species). There were 45 species of seaweeds belonging to 17 genera and 14 families. The Phaeophytes consisted 44.44 ((20 species); Chlorophytes 37.7; (17 species) and Rhodophytes 17.78 (8 species). Barangay San Antonio, an island barangay, has the largest number of species found and were abundant. Similar with other places, island people use seaweeds primarily for food (viand as salad and pickled, dessert as sweetened treat, beverage as juice), for medicine, source of income, for soil fertilizer, fish bait for selected species, dried and used as feeds for domestic animals, biological insect repellant, antihelminthic, used as packing materials, and to cover fish and other marine products while on transport to the market. Ethnobotanical practices related to seaweeds include: pregnant women may not be allowed to eat seaweeds; red seaweeds may not be consumed by domestic animals; only fresh seaweeds may be eaten; children, sick and older people may consume selected seaweeds, seaweed gathering after a typhoon is prohibited.

Keywords— seaweed, species, island town, abundant, ethnobotanical practices

INTRODUCTION

Seaweeds are macroscopic multicellular marine algae that live in the oceans. They belong to three groups and are differentiated by means of the color of their thallus; green, brown, and red. They grow in abundance especially in tropical climate. Many of them are edible and safe for human consumption[1].

The Philippines is one of megadiversity countries and comprises high population. This exerts tremendous pressure to transform these marine resource into material wealth that will lift the people out of poverty. This resource must be conserve [2], [3]. Awareness of the people about the rich biodiversity and the role of education should be emphasized. Attempts to identify methods of maintaining and using biodiversity in ways that can benefit the human population is the major role of conservation biology [4].

According to Wilson and Pimm, at 1% extinction rate, one-fourth of the world's current animal and plant species could be gone by 2050 [5]. Myers states that humans will impoverished the biosphere… [6]. Species with low population density are more prone to extinction. Organisms in small restricted areas, such as **islands**, are more prone to extinction because an environmental change in their locale can eliminate the entire species at once [7].

Living organisms provide us with many useful drugs. The United Nations Development Programme (UNDP) estimates the value of pharmaceutical products derived from developing world. Plants, animals, and microbes are estimated to be more than 30 billion dollars per year [8]. Because we don't fully understand the complex interrelationships between organisms, we often are surprised and dismayed at the effects of removing seemingly insignificant members of biological communities. Maintaining biodiversity is essential to preserving these biological and ecological services [9].

Thus, this study of seaweeds in the island town of Biri may open for more conservation and preservation practices for these marine plants for now and the future generations of island folks in the country. Due to the various benefits we can get from seaweeds (algae), it is but timely and relevant to further more research and study on these peculiar marine organisms.

I. OBJECTIVES

The objectives of this study are:

1. To identify species composition and abundance of macro-seaweeds in the island town of Biri, Northern Samar, Philippines;
2. To determine their economic uses; and
3. To determine the ethnobotanical practices related to seaweeds of the island people.

II. METHODOLOGY

The island of Biri is located on the northern most tip of the province of Northern Samar, facing the blue sea of the Pacific Ocean on the east side, and San Bernardino Strait on the west side. The municipality comprises eight barangays; four are within the island while four others are island barangays.

The island municipality is visited by local and foreign tourists for its beautiful and enchanted rock formations found in Barangay Progress (Kauswagan). It takes 60-90 minutes to reach the island coming from the docking ports of the coastal municipality of either Lavezares, San Jose, or Allen.

The study was conducted summer months of 2017-2018 in the four barangays; i.e. Sto. Nino (Palhugan), Progress (Kauswagan), San Antonio, and Poblacion. Methods used were systematic quadrat sampling, transect walks, line intercept method, ocular inspection, interviews, and snorkeling (up to 1m depth).

Fig. 1. Island town of Biri, Northern Samar, Philippines

III. RESULTS AND DISCUSSION

A. Species Composition of Seaweeds

There were 45 species of seaweeds belonging to 17 genera and 14 families. The Phaeophytes consisted 44.44 ((20 species); Chlorophytes 37.7; (17 species) and Rhodophytes 17.78 (8 species). Barangay San Antonio, an island barangay, has the largest number of species found and were abundant.

TABLE I
SEAWEED RESOURCES OF BIRI, NORTHERN SAMAR, PHILIPPINES

Class Phaeophyceae (20 species)

Sargassum binderi Sonder in .G. Agardh
crassifolium J.G. Agardh
cristaefolium C. Agardh
feldmannii Pham Hoang
gracillimum Reinbold
hemiphyllium C.A. Agardh
ilicifolium (Turner)C.A. Agardh
oligocystum Montagne
paniculatum J.G. Agardh
polycystum C.A. Agardh
turbinariorides Grunow

Hydroclathrus clathratus (C. Agardh) Howe
tenuis Tseng et Lu

Turbinaria canoides (J. Agardh) Kutzing
decurrens Bory de Saint-Vincent
luzonensis Taylor
ornate (Turner) J. Agardh

Padina australis Hanck
japonica Yamada
minor Yamada

Class Chlorophyceae (17 species)

Ulva intestinalis Linnaeus
lactuca Linnaeus
pertusa Kjellman
reticulata Forsskal

Caulerpa brachypus Harvey
lentillifera J. Agardh
racemose (Forsskal) J. Agardh
serrulata (Forsskal) J. Agardh
sertularioides (Forsskal) J. Agardh
taxifolia Linnaeus

Halimeda cylindracea Decaisne

macrolaba Decaisne
Opuntia Linnaeus

Enteromorpha clathrate (Roth) Greville

Avrainvillae erecta (Berkeley) A Gepp

Codium geppiorum O.C. Schmidt

Chaetomorpha crassa (C. Agardh) Kutzing

Class Rhodophyceaeae (8 species)

Gracillaria salicornia (C. Agardh) Dawson

Liagoropsis schrammii (Borgesen) Doty and Abbott

Galaxaura oblongata (Ellis and Solander) Lamouroux

Amphiroa fragilissima (Linnaeus) Lamouroux

Amphiroa foliacea Lamourou

Kappaphycus alvarezii Doty
cottonii (Weber van Bosse) Doty

Eucheuma denticulatum J. Agardh

B. Abundance of Seaweeds

Ulva lactuca, a Chlorophyte (green algae), was found to be present in all the sampling areas and in large quantities. This species has expanded thin glossy wide sheets with lobe undulating margin. They grow on intertidal areas exposed during low tides in shallow water near shore, or attached to other seaweed species such as *Sargassum.* The environmental conditions, i.e. temperature, current, wave action, salinity, substrate, depth, etc. favored the growth and distribution of this species of seaweeds.

Because they are friends with *Ulva lactuca*, the *Sargassum (*Phaeophyte – brown algae*)* genera has many species found (i.e. 11 species). They form probably a mutual understanding on how they could live harmoniously in the sea. Further studies may found their associations and behavior.

Although Biri island is now visited by many tourists, the municipal government is on the lookout of the carrying capacity of the island, pollution controls are executed, security and maintenance are imposed.

TABLE II
FAMILIES AND GENERA WITH NUMBER OF SPECIES

FAMILIES	GENERA	NUMBER OF SPECIES
Sargassaceae	Sargassum	11
	Turbinaria	4
Ulvaceae	Enteromorpha	1
	Ulva	4
Caulerpaceae	Caulerpa	6
Halimedaceae	Halimeda	3
Udoteaceae	Avrainvillea	1
Codiaceae	Codium	1
Cladophoraceae	Chaetomorpha	1
Scytosiphonaceae	Hydroclathrus	1
Dictyotaceae	Padina	4
Gracilariaceae	Gracillaria	1
Nemaliaceae	Liagoropsis	1
Galaxauraceae	Galaxaura	1
Corallinaceae	Amphiroa	2
Solieriaceae	Kappaphycus	2
	Eucheuma	1

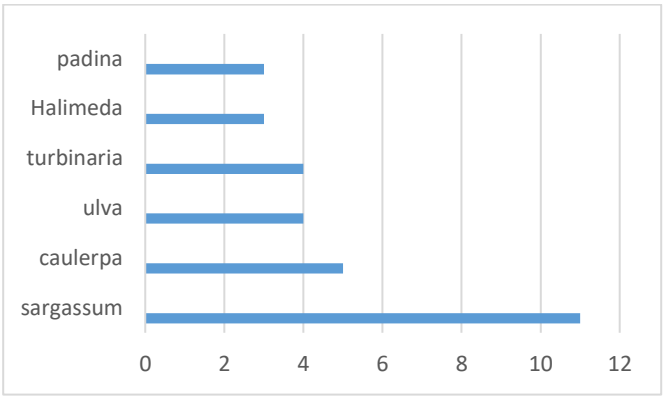

Fig. 2. Most abundant seaweed genera in Biri, Northern Samar

C. Economic Uses of Seaweeds

Similar with the other places, island people use seaweeds primarily for food ; viand as salad and pickled, dessert as sweetened treat, beverage as juice for medicine, source of income, for soil fertilizer, fish bait for selected fishes, dried and used as feeds for domestic animals, biological insect repellant, anti-helminthic, used as packing materials, and to cover fish and other marine products while on transport to the market.

D. Ethnobotanical Practices Related to Seaweeds

Ethnobotanical practices related to seaweeds include: pregnant women may not be allowed to eat seaweeds; red seaweeds may not be consumed by domestic animals; only fresh seaweeds may be eaten; children, sick and older people may consume selected seaweeds, seaweed gathering after a typhoon is prohibited.

IV. CONCLUSIONS

Phaeophytes (brown algae) are abundant during the summer months as shown by a higher number of collected species.. It is known that the photosynthetic activity of these marine organisms highly favored high temperature and salinity; so they thrive well during the summer season. Seaweeds have many uses to island people. Some cultural beliefs of island people are related to seaweeds.

V. RECOMMENDATIONS

1. Conserving the economically and ethnobotanically important marine plant life.
2. Propagating economically viable seaweeds in the island towns of the province.
3. Evaluating seaweeds as well as other marine plant life in the island, using the IUCN Red List Categories Version 3.1, series 2001, or the latest reference.

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