



## RESEARCH PAPER

## OPEN ACCESS

**Seaweeds species in Tres Marias, Palompon, Leyte, Philippines**

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*Cebu Normal University, Osmeña Boulevard, Cebu City, Philippines***Key words:** Seaweeds, Chlorophytes, Phaeophytes, Rhodophytes, Palompon, Leyte, Tres Marias<http://dx.doi.org/10.12692/ijb/20.6.289-294>

Article published on June 30, 2022

**Abstract**

Seaweeds are important marine life. It has several uses people can avail of. The taxonomy of seaweeds plays an important component in the successful bid for its proper management, conservation, and preservation. The study was on seaweeds species found in the three islets of Palompon, Leyte. The investigation was on chlorophytes (green seaweeds), phaeophytes (brown seaweeds), and rhodophytes (red seaweeds). The descriptive method was used. Samples were collected randomly from the sampling sites where the seaweeds thrive. Twenty-five species (25) of seaweeds species were found along with the Tres Marias of Palompon, Leyte. Ten (10) species of Chlorophytes, four (4) species of Phaeophytes, and eleven (11) species of Rhodophytes. Seaweeds species vegetation in Cabgan islet is much better than Taboc islet and slightly better than Gumalac islet. Of the twenty-five species gathered in Tres Marias islets, both in the intertidal and subtidal zones, only seven (7) of them are available in Taboc islet, twenty-two (22) in Gumalac islet, and twenty (20) in Cabgan islet. Seaweeds bear interesting prospects for added income to alleviate the economic life of the fishermen in the coastal barangays of Palompon, Leyte.

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## Introduction

Seaweeds are important marine life. It has several uses people can avail of like: food, sea vegetable, salad, soups, and as low calorie-dietetic food, fertilizers, pharmaceuticals, and other products for human consumption (Brooker *et al.*, 2008, Hong D. D. *et al.*, 2007, Campbell and Reece 2005, Jimenez-Escrig, *et al.*, 2000, 1999, Renn D. 1997). It can never be overemphasized that the enumeration of seaweeds plays an important component in the successful bid for its proper management, conservation, and preservation. The availability of information on the presence of this natural resource enables resource managers and development workers to come up with strategies as to the disposition and allocation of the existing natural resource for socio-economic utilization, conservation or sustained reproduction, and protection when the resource is in danger of depletion or extinction. The municipality of Palompon, Leyte is predominantly a coastal town and is popular on marine resources. It has the widest shoal in the entire province with three protective islets known as Tres Marias which are significantly located adjacent to the foreshore of the Poblacion of the town (Costelo 1982).

The bottom part of the marine vegetation in the Palompon shoal dries up widely during low tides easily becomes an interesting area for fisherfolks in coastal barangays who are largely dependent on the marine resources for livelihood. The littoral area, shoal area between high and low tide levels, is wide that for a day many of them cannot go around the whole span of the dry portion of the Tres Marias islets as the high tide comes along (Costelo 1982).

One of the interesting marine resources of Palompon is the multicellular seaweeds, which belong to the three phyla, such as chlorophytes (green), phaeophytes (brown), and rhodophytes (red) seaweeds. It is common knowledge in town that the Palompon fishermen are gathering some kinds of seaweeds that are used for food, fodder, fertilizers, and medicine through the years. Seaweeds represent the major primary producers in the shallow coastal environment on which other members of the food

chain directly or indirectly depend. All unicellular and multicellular seaweeds provide food for microorganisms that larger animals and fish can eat (Trono Jr., 1986).

Notably, Palompon garnered awards that underscore the impressive development of Tres Marias islets where mangroves, seaweeds, and other marine resources thrive. The development of mangroves in Tres Marias is going on but the said development is not limited to mangroves but also to other indigenous marine resources that abound in the Palompon waters. One of these is the seaweeds that present their accurate documentation on their enumeration in Tres Marias yet to be realized. Surveys and assessments of the Tres Marias were focused more on birds (SNS 2000), mangroves (Picardal *et al.*, 2011), fish corals (Cabansag *et al.*, 2011), and rabbitfishes (Reposar 2003). The enumeration of the presence of Palompon seaweeds species is certainly welcome information and add-on knowledge to both formal and non-formal educational aspects of the municipality.

This study is conducted to help provide viable information and obtain data on macro benthic seaweeds on the three islets to bear marked significance and important inputs on the needed profile of the marine life in Tres Marias of Palompon, Leyte, a major municipality in Northwestern Leyte. The study was on seaweeds species in the municipal waters of Palompon, Leyte. Specifically, the sub-problems are considered: a) seaweeds species found in the three islets and b) seaweeds species according to location and zonation.

## Materials and methods

### Research Design

Since this study centers on determining the seaweeds resources available on the three islets of Palompon, Leyte, the descriptive method was availed of. Specifically, among the types of descriptive researches, the laboratory analysis, and qualitative type were used since the study availed of the laboratory services of PIT Research Services and a major marine research center, the Biology Department of the University of San Carlos in Cebu City.

### Research Environment

The scope of the study centered on the seaweeds resource of the three interesting islets of Palompon, Leyte which is popularly known as Tres Marias comprising the islets of Taboc, Gumalac, and Cabgan. Among the three islets, Taboc is the nearest in the town proper. Cabgan island is the farthest among the three study areas. The islet between Taboc island and Cabgan island is the islet of Gumalac which is the biggest among the three islets. There were eight (8) sampling sites in each islet or a total of twenty-four sampling sites for the three islets of Tres Marias.

### Data-Gathering Procedure

The permission of the municipal government with its approval from the Office of the Municipal Mayor was sought before the seaweeds samples were gathered. The approved permission was also referred to the office of the Municipal Environment and Natural Resources Officer (MENRO) for appropriate action. The data gathered were recorded, tabulated, analyzed, and interpreted.

### Sampling Procedure

Samples were collected randomly from the eight (8) sampling sites of the islets where the seaweeds were observed to thrive. The enumeration of the seaweed species was dealt with by quadrat in the identified sample sites. A dive knife was used to gather the samples. The samples were placed in plastic bags identified by a number corresponding to the collecting site (Hurtado and Ragaza 1999). Occurrences and enumeration were noted and recorded. The classification was based on the reproductive structures of the generative plants. However, since most seaweeds hardly bear floral assemblages, the vegetative structure which was found in references in the classification of the seaweed species was adopted in the study. Likewise, the help of the researchers of the Research and Extension Services of the Palompon Institute of Technology was sought in this regard. More fully, regular consultations and assistance with the experts on this regard from the Department of Biology of the University of San Carlos in Cebu City were sought for further particulars and specifics of this research project.

## Results and discussion

### Seaweeds Species

Twenty-five (25) representative species of the marine microbenthic algae in Palompon, Leyte are gathered in the Tres Marias islets. They are made available from the intertidal and subtidal zones of Taboc, Gumalac, and Cabgan islets. The species are grouped into three as 1) Chlorophytes, 2) Phaeophytes, and 3) Rhodophytes. The aforesaid species are discussed by a) order, b) family, and c) common name (if available).

### Chlorophytes

The marine seaweeds gathered in Tres Marias islets consist of ten (10) species. They are *Boergeresia forbesii*, *Caulerfa lentillifera*, *Chaetomorpha crassa*, *Codium arabicum*, *Enteromorpha intestinalis*, *Halycoryne wrightii*, *Halimeda macroloba*, *Halimeda opuntia*, *Ulva reticulata*, and *Valonia aegagrophila*.

<b><i>Boergeresia forbesii</i></b> (Harvey J. Feldmann) Order Siphonocladales Family Siphonocladaceae Common Name: Iba-Iba	<b><i>Caulerfa lentillifera</i></b> (J. Agardh) Order Bryopidales Family Caulerpaceae Common Name: Lato
<b><i>Chaetomorpha crassa</i></b> (C. Agardh) Order Cladophorales Family Cladophoraceae Common Name: Lukot-lokot	<b><i>Codium arabicum</i></b> (Kiitzing) Order Bryosidales Family Codiaceae
<b><i>Enteromorpha intestinalis</i></b> (Linnaeus) Nees Order Ulvales Family Ulvaceae	<b><i>Halycoryne wrightii</i></b> (Harvey) Order Dasycladales Family Polyphyceae
<b><i>Halimeda macroloba</i></b> (Decaisne) Order Bryosidales Family Halimedaceae Common Name: Mani-mani (Dagko)	<b><i>Halimeda opuntia</i></b> (Linnaeus) Lamouroux Order Bryosidales Family Halimedaceae Common Name: Mai-mani (gagmay)
<b><i>Ulva reticulata</i></b> ((Forskal) Order Ulvales Family Ulvaceae	<b><i>Valonia aegagrophila</i></b> (C. Agradh) Order Siphonocladales Family Valoniaceae

LEGEND	LOCATION	ZONATION	* - presence of seaweeds species
E – east	NE – northeast	it – intertidal zone	
N – north	NW – northwest	st – subtidal zone	
W – west	SW – southwest		
S – south	SE – southeast		

*Phaeophytes*

The brown seaweeds are gathered in the lower intertidal and subtidal zones in the three islets of Palompon. Four (4) phaeophytes are made available in Tres Marias which are as follows: *Padina australis*, *Sargassum cinctum*, *Turbinaria canoides*, and *Turbinaria ornata*.

***Padina australis*** (Hauck) ***Sargassum cinctum***

Order Dictyotales	(J.G. Agardh)
Family Dictyotaceae	Order Fucales
Common Name: Dunggandungan	Family Sargassaceae
	Common Name: Pinong Samo

***Turbinaria conoides*** ((J. Agardh) Kutziiing) ***Turbinaria ornata***

Order Fucales	(Turner) J. Agardh
Family Sargassaceae	Order Fucales
Common Name: Samo	Family Sargassaceae
	Common Name: Tubol <sup>2</sup>

LEGEND	LOCATION	ZONATION	* - presence of seaweeds species
E – east	NE – northeast	it – intertidal zone	
N – north	NW – northwest	st – subtidal zone	
W – west	SW – southwest		
S – south	SE – southeast		

*Rhodophytes*

Eleven (11) species of red seaweeds were gathered, which are *Actinotrichia fragilis*, *Amphiroa foliacea*, *Amphiroa fragilissima*, *Galaxaura oblongata*, *Gelidiella acerosa*, *Gracilaria edulis*, *Gracilaria eucheumoides*, *Gracilaria Salicornia*, *Hypnea boergesenii*, *Kappaphycus alvarazii*, and *Kappaphycus striatum*.

***Actinotrichia fragilis*** ***Amphiroa foliacea***

(Forsk) Borgesen	(Lamouroux)
Order Bonnemaisoniales	Order Corallinales
Family galaxauraceae	Family Corallinaceae

***Amphiroa fragilissima*** ***Galaxaura oblongata***

(Linnaeus)	(Ellis and Solander)
Lamouroux	Order Bonnemaisoniales
Order Corallinales	Family Galaxauraceae
Family Corallinaceae	

***Gelidiella acerosa*** ***Gracilaria edulis*** (S.G. (Forsk) Feldman and Hamel)

Hamel	Gmelia) P.C. Silva
Order Gelidiales	Order Gigartinales
Family Gelidiaceae	Family Gracilariaceae
	Common Name: Goso-goso

***Gracilaria eucheumoides*** (Harvey)

Agardth) Dawson	<b><i>Gracilaria Salicornia</i></b> (C. Dawson)
Order Gigartinales	Order Gigartinales
Family Gracilariaceae	Family Gracilariaceae
Common Name: Ambang	

***Hypnea boergesenii*** ***Kappaphycus alvarazii***

((Tanaka)	(Doty) Doty
Order Gigartinales	Order Gigartinales
Family Hypneaceae	Family Solieriaceae
	Common Name: Goso

***Kappaphycus striatum***

(Schmitz) Doty
Order Gigartinales
Family Solieriaceae
Common Name: Kapkap

Two main loci are considered in the discussion of the research sites to include: intertidal zone and subtidal zone. Of the twenty-five species gathered in Tres Marias islets, only seven of them are available in the intertidal and subtidal zones of Taboc islet. There are only two (2) chlorophytes, *Halimeda macroloba*, and *Halimeda opuntia*, four (4) phaeophytes, *Padina australis*, *Sargassum cinctum*, *Turbinaria canoides*, and *Turbinaria ornata*, and one (1) rhodophyte, *Amphiroa foliacea*.

In Gumalac islet, there are nine (9) chlorophytes, *Boergesenia forbesii*, *Caulerfa lentillifera*, *Chaetomorpha crassa*, *Codium arabicum*, *Enteromorpha intestinalis*, *Halycoryne wrightii*, *Halimeda macroloba*, *Halimeda opuntia*, and *Valonia aegagropila*. Four (4) phaeophytes, *Padina australis*, *Sargassum cinctum*, *Turbinaria canoides*, and *Turbinaria ornata*. and nine (9) rhodophytes, *Actinotrichia fragilis*, *Amphiroa foliacea*, *Amphiroa fragilissima*, *Galaxaura oblongata*, *Gelidiella acerosa*, *Gracilaria edulis*, *Gracilaria eucheumoides*, *Gracilaria Salicornia*, and *Hypnea boergesenii*. A total of twenty-two species are found both at the research stations of the intertidal and sub-tidal zones of the islet.

The seaweeds vegetation in Cabgan islet is better than the two islets. In the average rate, the presence of seaweeds that abound the intertidal and subtidal areas of the islet can be considered the same in the magnitude of both zones. There are eight (8) species of green seaweeds, *Boergesenia forbesii*, *Chaetomorpha crassa*, *Codium arabicum*, *Enteromorpha intestinalis*, *Halimeda macroloba*, *Halimeda opuntia*, *Ulva reticulata*, and *Valonia aegagropila* are found in both zones.

The phaeophytes therein are *Padina australis*, *Sargassum cinctum*, *Turbinaria canoides*, and *Turbinaria ornata*. A focus on the rhodophytes shows that there are eight (8) species of red seaweeds. These rhodophytes are the following: *Amphiroa foliacea*, *Amphiroa fragilissima*, *Galaxaura oblongata*, *Gelidiella acerosa*, *Gracilaria edulis*, *Hypnea boergesenii*, *Kappaphycus alvarezii*, and *Kappaphycus striatum*.

In general, the seaweeds vegetation in Cabgan islet is much better than Taboc islet and slightly better than Gumalac islet. The presence of the seaweeds that abound Cabgan islet in the intertidal and subtidal zones can be considered the same in the distributive magnitude. It is implied therefore that the seaweeds industry in Palompon can start in the seaweeds resources of Cabgan islet which can be more abundant if given the necessary development, care, and concern by concerned public and private authorities.

### Conclusion

Based on the findings of the study, twenty-five species of seaweeds (green, brown, red) are enumerated in the islets of Taboc, Gumalac and, Cabgan of Palompon, Leyte both in the intertidal and subtidal zones are economically important in terms of medicine, food, fodder, fertilizers, agar and many more so that aside from being producers that support life in marine habitats, seaweeds bear interesting prospects for added income to alleviate the economic life of the fishermen in the coastal barangays of Palompon, Leyte.

### Acknowledgment

This research acknowledge the time and effort shared by my research assistants and colleagues in the department who assisted in the field work, data gathering and analysis of data.

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