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Thriving Seagrasses in Rocky Sandy Substrate in Tinabilan, Northwest Leyte, Philippines

Jason G. Tuang-tuang
Palompon Institute of Technology
Corresponding Author: Jason G. Tuang-tuang jason.tuangtuang@pit.edu.ph

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A B S T R A C T

The coastline of Palompon, Leyte has endowed with rich seagrass abundance and diversity which supports the well-established Siganid industry. Baseline information on the cover and species composition were gathered using the transect-quadrat method. Results showed that there were four (4) species of seagrasses identified in the coastal area of Tinabilan, Palompon, Leyte. Cymodocea rotundata and Thalassia hemprichii were observed in all the sampling stations. The average percentage cover of seagrasses was 8.36% which revealed in poor condition. However, the poor percentage cover condition can be associated with the topography and environmental factors in the area which is observed to have been dominated with rocky-sandy substrate and high temperature which possibly affects negatively the biological processes of the seagrass species.

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INTRODUCTION

Seagrass ecosystem significantly contribute wide array of ecological and economic services (Hamisain et al., 2020; Dewi and Sukandar, 2017). They provide habitat for diverse marine organisms, serve as spawning and nursery areas for several fishes, food source for marine turtles and herbivorous fishes (Sidik et al., 2010; Short & Green, 2003; Meñez et al., 1983). Also, seagrasses stabilize the sediments that were deposited through run-off from upland areas and protect the coastal areas (Short et al., 2007).

Azanza et al. (2017) estimated that a hectare of healthy seagrass meadow provides Php 1,445,850/ha/year of total economic services. The Philippines being considered as one of biodiversity hotspots in the world, ranked second to Australia in terms of the total number of seagrass species recorded in the world (Hamisain et al., 2020; Green and Short, 2003; Meñez et al., 1983). This is expected as it is considered as the center of the center of marine biodiversity in the Coral Triangle and the world due to the high abundance and diversity of marine resources (Licuanan et al., 2019; Licuanan et al., 2017). These resources greatly support the population in terms of food and livelihood (Russ and Alcala, 1999). In Tinabilan, Palompon, Leyte, seagrasses are naturally occurring and was observed to have declined over the years. Although the barangay established a sanctuary, only the coral reef ecosystem was incorporated inside the sanctuary (Tuang-tuang, 2021; Tuang-tuang et al., 2021).

THEORETICAL REVIEW

However, the poor percentage cover condition can be associated with the topography and environmental factors in the area which is observed to have been dominated with rocky-sandy substrate and high temperature which possibly affects negatively the biological processes of the seagrass species. They provide habitat for diverse marine organisms, serve as spawning and nursery areas for several fishes, food source for marine turtles and herbivorous fishes (Sidik et al., 2010; Short & Green, 2003; Meñez et al., 1983). Also, seagrasses stabilize the sediments that were deposited through run-off from upland areas and protect the coastal areas (Short et al., 2007). These huge economic contribution of seagrasses were less recognized by local community. The Philippines being considered as one of biodiversity hotspots in the world, ranked second to Australia in terms of the total number of seagrass species recorded in the world (Hamisain et al., 2020; Green and Short, 2003; Meñez et al., 1983). This is expected as it is considered as the center of the center of marine biodiversity in the Coral Triangle and the world due to the high abundance and diversity of marine resources (Licuanan et al., 2019; Licuanan et al., 2017). These resources greatly support the population in terms of food and livelihood (Russ and Alcala, 1999).

METHODOLOGY

The transect-quadrat method of English et al. (1997) with slight modification were used to assess the community structure (species composition, dominance, frequency, relative values) within the Tinabilan seagrass meadows. Five sampling stations were established in the seagrass meadows which would serve as monitoring stations for future reassessment and monitoring activities

(Figure 1). Three (3) 50-m transect lines were laid out randomly in the seagrass meadows parallel to the shore, following the contours of the seagrass meadows (Figure 2).

Figure 1. Location of the Sampled Quadrats in Tinabilan Seagrass Meadows, Tinabilan, Palompon, Leyte

Figure 2. Transect Lines were Laid Parallel to the Shoreline

Every 10-m interval of the transect line data were collected using a 1x1 quadrat. The overall percentage cover of all species present inside the quadrat were estimated (Figure 3). All seagrass species present inside the quadrat were identified and their corresponding percentage covers were estimated.

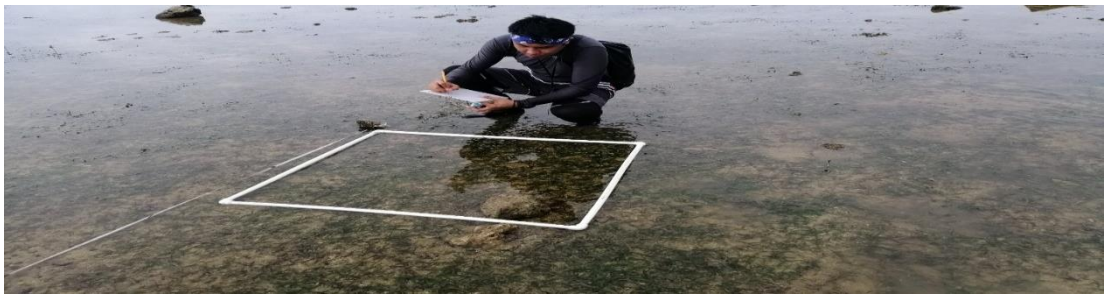

Figure 3. Seagrass Community Assessment : a Seagrass Ecologist Percentage Cover of the Seagrass Species Inside the Quadrat

RESULTS AND DISCUSSIONS

Species Composition and Distribution

Table 1. Species Composition of Seagrasses in Tinabilan, Palompon, Leyte

Family	Scientific Name	Common Name
Cymodoceaceae	Cymodocea rotundata	Manatee-grass
	Halodule pinifolia	Needle-grass
Hydrocharitaceae	Halophila minor	Paddle weed
	Thalassia hemprichii	Sickle-grass

The total seagrass species recorded in Tinabilan represent around 26.67% of the total 15 seagrass reported in the Philippines (Short et al., 2007; Calumpong & Meñez, 1997; Meñez et al., 1983). The recorded seagrass species recorded were widely-distributed in the Philippines and in the Indo-west Pacific region (Short et al., 2007; Green and Short, 2003). Moreover, T. hemprichii and C. rotundata provide significant importance as food source of sea turtles (Philips and Meñez, 1988) and immensely support the siganid fishery in Palompon, Leyte (Paraboles & Campos, 2017; Cabansag et al., 2011). Furthermore, the species H. minor was only recorded in station 4. This species mixed with other seagrass species and outcompete for nutrients, space and light (Calumpong & Meñez, 1997; Meñez et al., 1983).

Table 2. Seagrass Distribution in the Sampling Stations

Species No.	Species	Station 1	Station 2	Station 3	Station 4	Station 5
1	Cymodocea rotundata	-	-	✓	✓	-
2	Halodule pinifolia	✓	✓	✓	✓	✓
3	Halophila minor	-	-	-	✓	-
4	Thalassia hemprichii	✓	✓	✓	✓	✓

Seagrass Abundance (Percent Cover)

It was observed that sandy-rocky substrate dominated in the area. Unlike seaweeds, seagrass prefer to proliferate in sandy-muddy areas wherein they anchor their roots and actively stabilizes the sediments (Short et al., 2007; Calumpong & Meñez, 1997). Temperature and salinity influence seagrass growth and distribution. High temperature was observed in the intertidal zone during the daytime which potentially affects the biochemical processes involved in photosynthesis and respiration (Lee et al., 2005). When seawater temperature increases, the salinity also increases which significantly influenced seagrass morphology and physiology (Taiz & Zeiger, 2009).

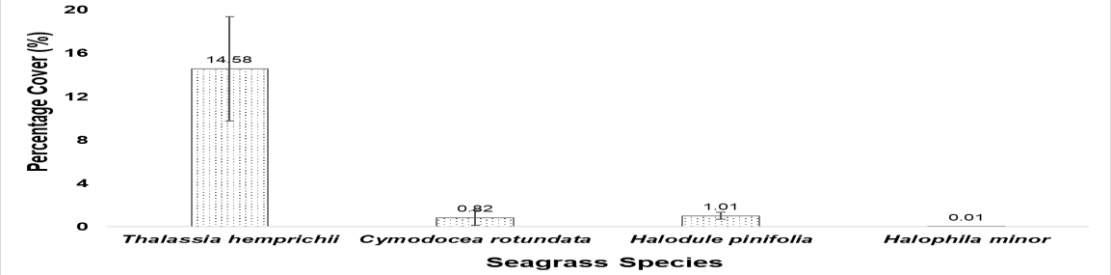

Figure 4. Average Percentage Cover of Seagrass Species Recorded in Tinabilan, Palompon, Leyte

CONCLUSIONS AND RECOMMENDATIONS

This study revealed that four seagrass species thrived in the seagrass meadows of Tinabilan, Palompon, Leyte. Unfortunately, the average seagrass cover conditions fall in poor conditions due to natural, physiological and anthropogenic activities. The findings can be utilized for monitoring activities in the future and could be a basis for amendment of conservation policies especially that no significant portion of the seagrass meadows were included in the established sanctuary**.**

FURTHER STUDY

These huge economic contribution of seagrasses were less recognized by local community. The Philippines being considered as one of biodiversity hotspots in the world, ranked second to Australia in terms of the total number of seagrass species recorded in the world (Hamisain et al., 2020; Green and Short, 2003; Meñez et al., 1983). This is expected as it is considered as the center of the center of marine biodiversity in the Coral Triangle and the world due to the high abundance and diversity of marine resources (Licuanan et al., 2019; Licuanan et al., 2017). These resources greatly support the population in terms of food and livelihood (Russ and Alcala, 1999).

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