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ORIGINAL RESEARCH ARTICLE

Baseline assessment of seagrass abundance and community structure in the coastal waters of barangay Poblacion as basis for coastal ecosystem management in Malay, Aklan.

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A B S T R A C T

Seagrass communities are vital in the coastal ecosystem, providing habitat, stabilizing sediment, and contributing to fisheries productivity. However, there is no baseline information for seagrass abundance and community structure in the coastal area of Poblacion, Malay, Aklan. To answer this gap, this study assessed seagrass cover, abundance, diversity and community structure to establish baseline data for the area. Sampling was conducted from February to April 2022 during daytime and low tide using the transect-quadrat method. A 25-grid quadrat was placed along three 50 m transect lines, with 10 m intervals between each quadrat. Overall, three species were recorded to be ecologically dominant—*Cymodocea rotundata, Thalassia hemprichii,* and *Halodule uninervis.* Of these, *C. rotundata* is the most dominant, with a total cover of 34.5%, the highest Frequency (85.3%), and the highest relative Frequency (26.9%). Meanwhile, the study site exhibits moderate and relatively balanced diversity and distribution of seagrass species, as indicated by a calculated Shannon-Wiener Diversity index (H' = 1.52) and evenness (J' = 0.78). The observed zonation pattern suggests that the area is favorable for habitat colonization. These findings provide a baseline for monitoring, protecting, conserving, and managing seagrass dynamics, as well as for sustainable biodiversity and the enrichment of Malay's coastal ecosystem.

Keywords: *Coastal habitat assessment, Malay Aklan, seagrass diversity, seagrass ecology, species composition*

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INTRODUCTION

Seagrasses are marine angiosperms that are submerged in water and evolved from their terrestrial plant ancestors. Morphologically, they share traits like leaves, flowers, vascular tissues, and roots, among others. These aquatic plants play a vital role in marine environments, serving as primary producers through photosynthesis and enhancing productivity through carbon sequestration, climate change mitigation, and maintaining sediment integrity. Seagrasses form meadows and are considered among the most productive ecosystems, providing refuge, food, and habitat for a diverse array of marine fauna (Bujang et al., 2016; McKenzie et al., 2020; Cayetano et al., 2025).

Morphologically, seagrass has a stem-like structure called rhizomes that create extensive horizontal networks beneath the sediment surface. The interconnection of rhizomes creates clonal growth, nutrient exchange, and increased biomass (Toro, 2023). Moreover, these rhizome systems help maintain seafloor integrity by forming mats that prevent soil erosion and provide coastal protection (Meňez and Phillips, 1983). As considered ecosystem engineers, it maintains the meadow substrate while enhancing habitat complexity in coastal environments (McKenzie et al., 2014; Vinson et al., 2016).

Approximately 72 seagrass species have been identified worldwide, belonging to four major families: Zosteraceae, Hydrocharitaceae, Posidonieae, and Cymodoceaceae (Kwan et al., 2023). The morphological variations of these species correspond to their ecological functionality, thus contributing to the overall marine biodiversity. In the Philippines, 18 seagrass species were identified, distributed across the archipelago (Fortes, 2013). Additionally, the recent discovery of the species *Halophila spinulosa* was made in Boracay Island, in Malay, Aklan (Chua, 2020). This highlights the country's rich biodiversity and potential discoveries, emphasizing the need for more ecological assessments in the localities.

Barangay Poblacion in Malay, Aklan, is a coastal barangay, home to a wide seagrass meadow that supports coastal livelihood. Dependence on seagrass meadows for food and income is a common scenario in coastal communities, including Barangay Poblacion, where local efforts, such as capture, gleaning and spearfishing, are being practiced. Despite the economic developments in the municipality, efforts to conduct an in-depth assessment of seagrass meadows on mainland Malay have not been undertaken, resulting in the unavailability of seagrass ecological data in local government agencies. Given the importance of seagrasses in the environment and the livelihoods of local communities, the absence of such scientific information in Malay may pose long-term challenges towards the sustainable management of its marine environment. The lack of empirical data will hinder the development of proper conservation, protection, and management strategies, leading to biodiversity loss, reduced fish productivity, and increased vulnerability to livelihoods among coastal communities (Exeter et al., 2021; Ward et al., 2022).

Given the existing knowledge gap, this study aimed to fill in and provide an answer through an in-depth assessment of seagrass species composition, abundance, dominance, contribution, distribution, diversity, and evenness in Barangay Poblacion, Malay, Aklan. This study hypothesized that seagrass meadows would have low diversity and seagrass cover due to various disturbances. Furthermore, it is expected that the findings of this study will serve as a baseline for local government units and stakeholders to make sustainable and informed management decisions. This aligns with the call for global sustainability efforts by contributing to Sustainable Development Goals (SDGs) 13 (Climate Action) and 14 (Life Below Water). The output of this study will also guide future researchers, strengthen local capacity for marine resources management, and environmental protection beyond the coastal areas of Poblacion, Malay, Aklan.

MATERIALS AND METHODS

Description of study area

This study was conducted in Barangay Poblacion, Malay, Aklan (11.901606° N, 121.900835° E). It is one of the 12 coastal barangays in the municipality, recognized for its rich marine biodiversity and extensive intertidal habitat (Figure 1). The study area has a wide seagrass meadow that is largely exposed during low tide. A combination of sandy, muddy, and rubble-type sediments also characterizes it. As a coastal municipality, the livelihoods of local communities depend on the farming of local crops and small-scale fisheries. Locally known as "eusay," seagrasses provide critical habitat and nursery grounds for a variety of marine organisms that sustain community food security and fisheries-based income. This research aimed to assess the composition, abundance, distribution, Frequency, evenness, and diversity of seagrass species in the area. The sampling site was identified in coordination with local government offices and selected based on the presence of wide seagrass meadows, which were presumed to support high seagrass diversity. The seagrass meadows become exposed during low tide, providing optimal accessibility for in-situ observations and data collection under standardized field conditions.

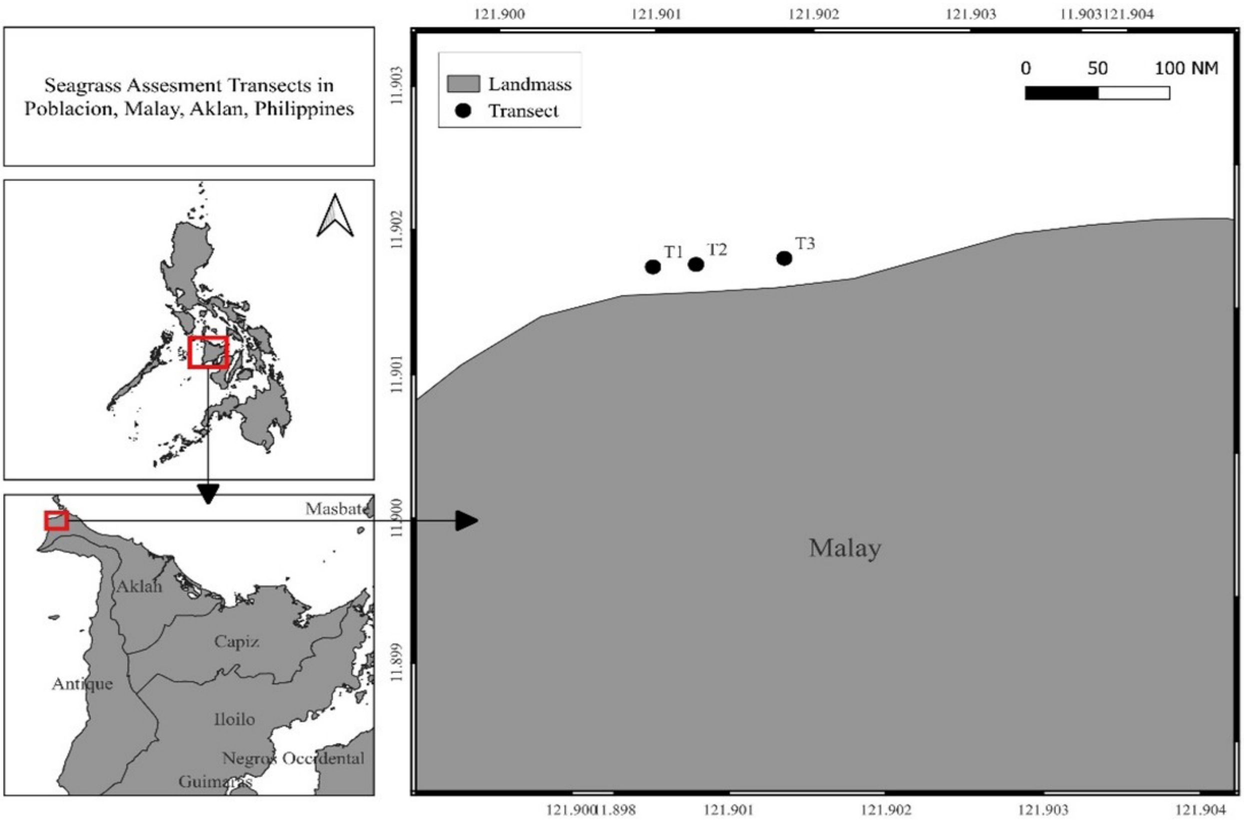

Figure 1. Location of the sampling site at Barangay Poblacion, Malay, Aklan, Philippines (generated using QGIS Software Version 3.36.0). The black dots represent the starting point of the transect line used during sampling.

Research design and data collection

This study employed a Completely Randomized Design (CRD). It used a stratified random sampling technique combined with the transect-quadrat method, following the methodologies of Saito and Atobe (1970) and Ganzon-Fortes (2011). The mentioned methodologies were applied, primarily to achieve the objectives of this study. All necessary permits were obtained from local agencies before conducting data collection. Three 50 m transect lines, 50 x 50 cm—with 25 grid quadrats, and a measuring tape were utilized in this study. A GPS device was used to determine the reference point and coordinate location, along with waterproof data sheets and a camera for documentation. These materials ensured standardized sampling and accurate field measurement of seagrass attributes.

A 50-meter transect line was established at the study site, with quadrats placed 10 meters apart along the transect. This is the commonly suggested method for marine-benthic habitat surveys to capture habitat variability. Sampling was carried out weekly during low tide, covering three sampling points spaced 50 meters apart. Photographs and samples were collected from each quadrat for species identification, verified through comparison with standard taxonomic references and field guides provided by McKenzie (2003) and DA-BFAR 5. Seagrass frequency was determined by its presence in the respective quadrats in every transect; similarly, the spatial distribution data were derived from the seagrass species present in every quadrat in relation to its distance from the shore. Sediment type was also observed to determine its relationship with dominant seagrass species. No data was recorded for the fifth quadrat (40-50 m) due to the absence of seagrass cover.

The abundance of seagrass species was determined using the methods of Saito and Atobe (1970) and Ganzon-Fortes (2011), which employed cover indices and corresponding multipliers (Table 1). The percentage of substratum covered by each species was classified into six index levels, each with an assigned multiplier value for data conversion. The fieldwork was conducted from February to April 2022, covering all scheduled low-tide sampling sessions (Saito and Atobe, 1970; Ganzon-Fortes, 2011).

Table 1. Index levels and corresponding multiplier used to estimate seagrass abundance and percentage cover at Barangay Poblacion, Malay, Aklan, Philippines

Index N	Degree of seagrass cover on a small square (qn) of the quadrat	Corresponding multiplier
6[a]	Covering 95% or 98%-100% of substratum surface	4
5	Covering 1/2 - 1/1 or 50% - 100% of the substratum surface	3
4	Covering 1/4 - 1/2 or 25% - 50% of the substratum surface	1.5
3	Covering 1/8- 1/4 or 12.5% - 25% of the substratum surface	0.75
2	Covering 1/16 - 1/8 or 6.25% - 12.5% of the substratum surface	0.375
1	Covering less than 1/< 6.25% of the substratum surface	0.1875

[a] Index no. 6 applies only to exceptional cases of macrophyte cover, in which the entire surface area of the small square (qn) is 98%-100% occupied by seagrass shoots. In such instances, no substratum remains exposed, and the resulting cover estimates may slightly underestimate the actual cover.

Data analysis

Data encoding and computation were performed using Microsoft Excel® to obtain descriptive statistics, species abundance, dominance, and distribution. Species composition and Frequency were analyzed by the seagrass species cover and presence in every quadrat per transect. To determine the relationship of seagrass percent cover to sediment types; the total seagrass species cover and observable sediment type per quadrat was examined using Principal Component Analysis in RStudio software version 4.4.2 (France). PCA displays a co-structure of seagrass species cover and the sediment type, allowing a clear evaluation of the possible patterns of how variables correspond to other.

Seagrass Species Abundance were expressed using the percentage cover method following Saito and Atobe (1970) and Ganzon-Fortes (2011), computed as:

$$C\% = (qn_5 \times 3) + (qn_4 \times 1.5) + (qn_3 \times 0.75) + (qn_2 \times 0.36) + (qn_1 \times 0.19) \quad \text{Eq. 1}$$

Where $C\%$ stand for the percentage cover and qn is the total number of quadrat-grids having cover corresponding to index (N) (Table 1).

To determine the Seagrass Species Dominance, computation of Percent Contribution (%*C*) was employed using the formula:

$$\%C \text{ of species } A = \frac{\text{total } C \text{ of species } A}{\text{summary of } C \text{ of all species}} \times 100 \quad \text{Eq. 2}$$

Where %*C* is the percent contribution of seagrass species (A); and *C* is the cover of seagrass species respectively.

Seagrass species diversity was obtained using the percent cover data and analyzed using the Shannon-Weiner Diversity Index (Jumawan et al., 2015; Abubakar and Echem, 2018; Capin et al., 2021; Molina and Bersaldo, 2024), computed as:

$$H' = -\sum (Pi) \times \ln (Pi) \quad \text{Eq. 3}$$

Where H' is the Shannon-Weiner Diversity Index; P*i* is the proportion of individuals in each species (ni/N); ni is the percent cover per seagrass species; *N* is the total percentage cover of all species; and finally, *ln* is the natural logarithm.

Furthermore, Pielou's index of evenness was used to measure the species' evenness, and computed as:

$$J' = \frac{H'}{\ln S\,(or\ Hmax)} \quad \text{Eq. 4}$$

Where J' is the Peilou's index of evenness; H' is the Shannon-Weiner Diversity Index; *S* is the species richness or the total number of species identified; Hmax or *ln S* the possible maximum Shannon-Diversity Index.

RESULTS

This study represents the first comprehensive assessment of seagrass species composition, abundance, distribution, Frequency, and diversity in the coastal waters of Barangay Poblacion, Malay, Aklan. The data collection was conducted in February to April 2022; tidal data were utilized to determine the most favorable time and date for sampling. Tidal measurements during the sampling were the following: 0.0 m at 7:21 AM, 0.1 m at 7:33 AM, 0.2 m at 7:53 AM, -0.2 m at 5:10 AM, and -0.1 m at 6:16 AM. These tidal measurements indicate low tide and are favorable for sampling. Transect lines were laid out—positioned across representative coastal sections to ensure consistency of data collection.

Species composition and abundance

This study recorded seven seagrass species belonging to two families in the coastal areas of Barangay Población, Malay, Aklan. The family Cymodoceaceae included *Halodule pinifolia, Halodule uninervis*, *Syringodium isoetifolium,* and *Cymodocea rotundata.* The family *Hydrocharitaceae comprised Enhalus acoroides, Thalassia hemprichii,* and *Halophila ovalis* (Figure 2). Each species exhibited distinct substrate preferences, thriving in varying combinations of muddy, sandy, and coral-rubble sediments.

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Figure 2. Identified seagrass species at barangay Poblacion, Malay, Aklan: (A) *Halodule uninervis*, (B) *Syringodium isoetifolium*, (C) *Cymodocea rotundata*, (D) *Thalassia hemprichii*, (E) *Halodule pinifolia*, (F) *Halophila ovalis*, and (G) *Enhalus acoroides*.

Seagrass abundance across three transects was determined from percentage cover, calculated as the proportion of quadrat area occupied by each species. As shown in Figure 3, Transect 1 (T1) was dominated by *H. uninervis* (34.83%), followed by *C. rotundata* (14.20%) and *T. hemprichii* (12.61%), with *S. isoetifolium* absent. Meanwhile, in Transect 2 (T2), *T. hemprichii* had the highest cover (37.50%), followed by *C. rotundata* (29.63%), while *E. acoroides* recorded the lowest (0.58%). In Transect 3 (T3), *C. rotundata* was dominant (36.89%), followed by *T. hemprichii* (26.72%). Across all transects, *C. rotundata* exhibited consistently high coverage, indicating strong ecological dominance.

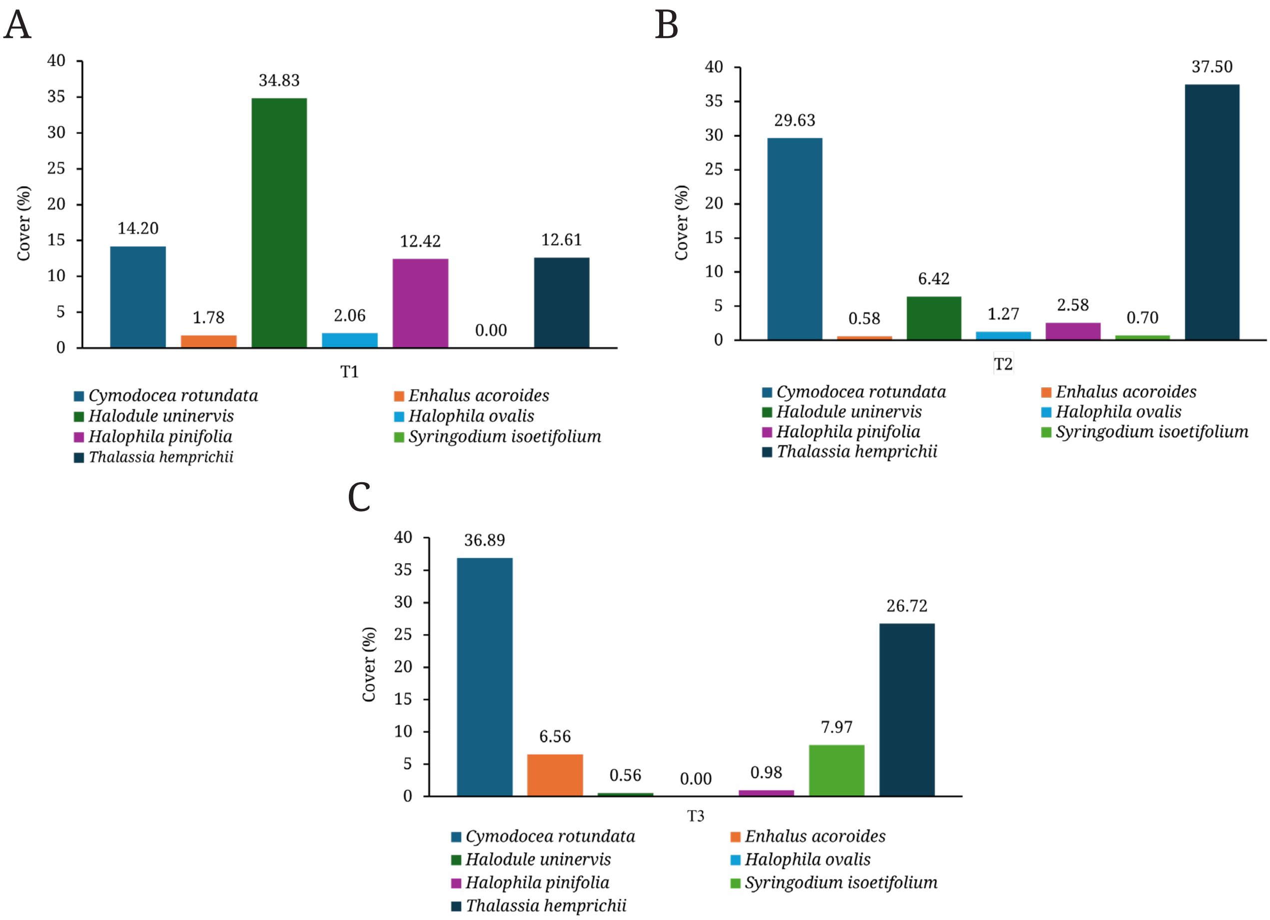

Figure 3. Seagrass species cover (%) per transect (Tn) in the study site. Panels A, B and C depict the percent cover of seagrass species in Transect 1 (T1), Transect 2 (T2) and Transect 3 (T3), respectively.

Species dominance and contribution

Species dominance and contribution of seagrass were determined using the Dominance Index, revealing that *C. rotundata* (34.48%), *T. hemprichii* (32.52%), and *H. uninervis* (17.7%) were the three dominant species based on overall percentage cover across transects (Figure 4). The remaining species–*H. pinifolia*, *E. acoroides*, *S. isoetifolium*, and *H. ovalis*–collectively contributed only 15.63% to total cover.

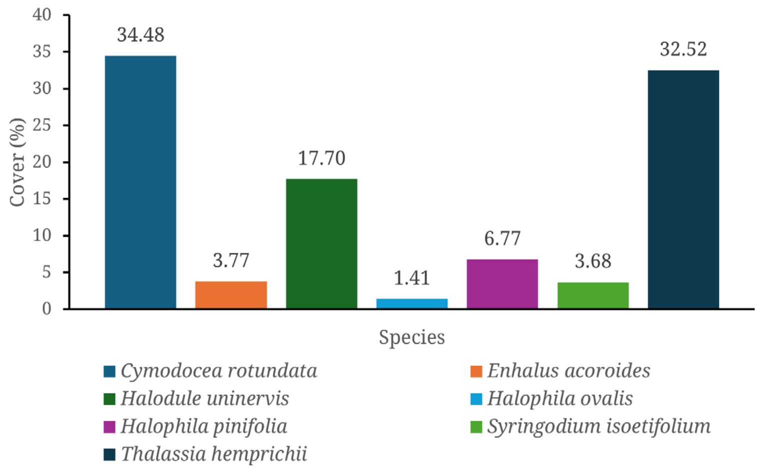

Figure 4. Dominance of seagrass species based on overall percentage cover (C%) at Barangay Poblacion, Malay, Aklan.

Frequency and habitat preference

The frequency and relative frequency of each seagrass species were calculated to assess the spatial distribution of seagrass species across the study site. *Cymodocea rotundata* exhibited the highest relative Frequency (RF) at 26.92%, followed by *T. hemprichii* (24.71%) and *H. uninervis* (18.61%) (Figure 5). The overall Frequency (F) results (Figure 6) showed that *C. rotundata* occurred in 85.33% of quadrats, *T. hemprichii* in 78.33%, and *H. ovalis* had the lowest occurrence (12%).

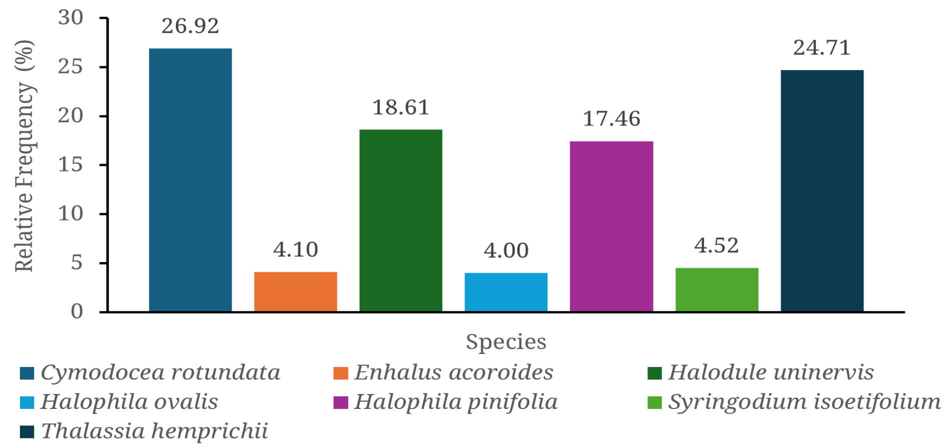

Figure 5. Relative Frequency (RF) of seagrass species at Barangay Poblacion, Malay, Aklan.

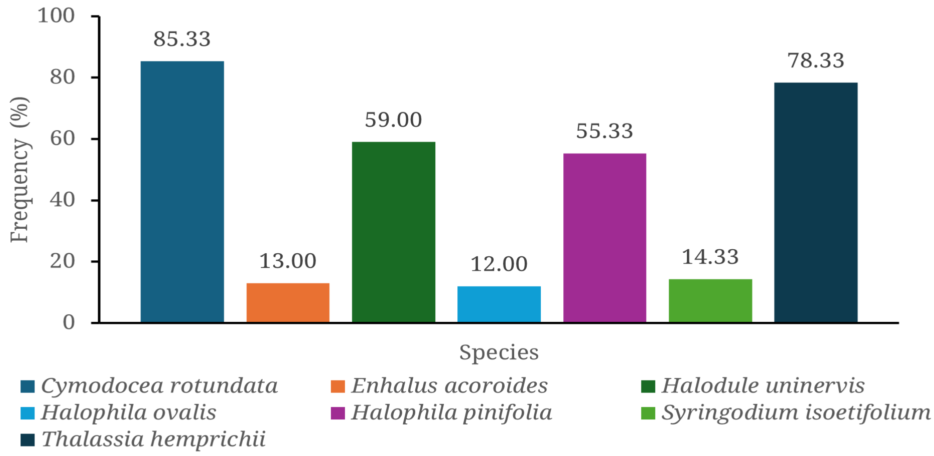

Figure 6. Frequency (F) of seagrass species occurrence across quadrats at Barangay Poblacion, Malay, Aklan.

Zonation patterns indicated species-specific spatial preferences along the shoreward-to-offshore gradient. Based on the overall cover across all transects, *C. rotundata* and *T. hemprichii* recorded percentage covers of 14.13% and 24.50% in Quadrat 1; 28.13% and 27.13% in Quadrat 2; 27.56% and 25.25% in Quadrat 3; and 27.13% and 26.56% in Quadrat 4, respectively (Figure 7). These results indicate that *C. rotundata* and *T. hemprichii* dominated all quadrats, with a noticeable increase in *H. uninervis* in Quadrat 3 (21.75%), while *H. pinifolia* showed a decreasing cover as the distance from the shore increased. Similar declining patterns were observed for *H. ovalis* and *E. acoroides*. Meanwhile, *S. isoetifolium* was recorded only in Quadrats 3 and 4, located farther offshore.

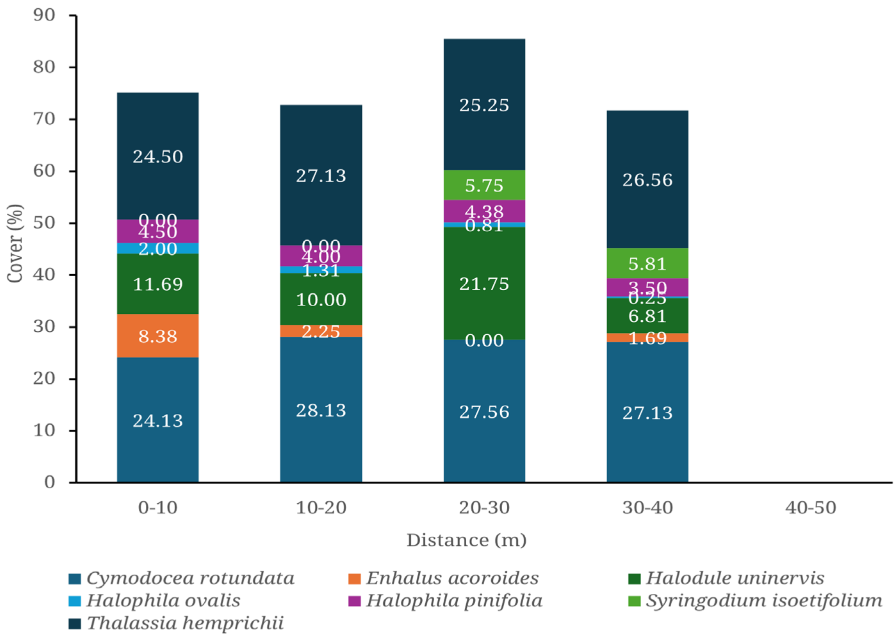

Figure 7. Zonation pattern of seagrass species cover (%) across the transect distance (m) going offshore.

PCA further examined species-substrate relationships, correlating sediment type with seagrass dominance. *Halophila pinifolia* and *H. uninervis* predominated in nearshore quadrats with muddy-sandy or even mixed sediment, while *C. rotundata, T. hemprichii, E. acoroides,* and *S. isoetifolium* were associated with offshore sandy-coarse substrates (Figure 8). Noticeably, *S. isoetifolium* showed a strong correlation with mixed and coarse sands, whereas no species were associated with coral-rubble sediment located 40-50 m offshore.

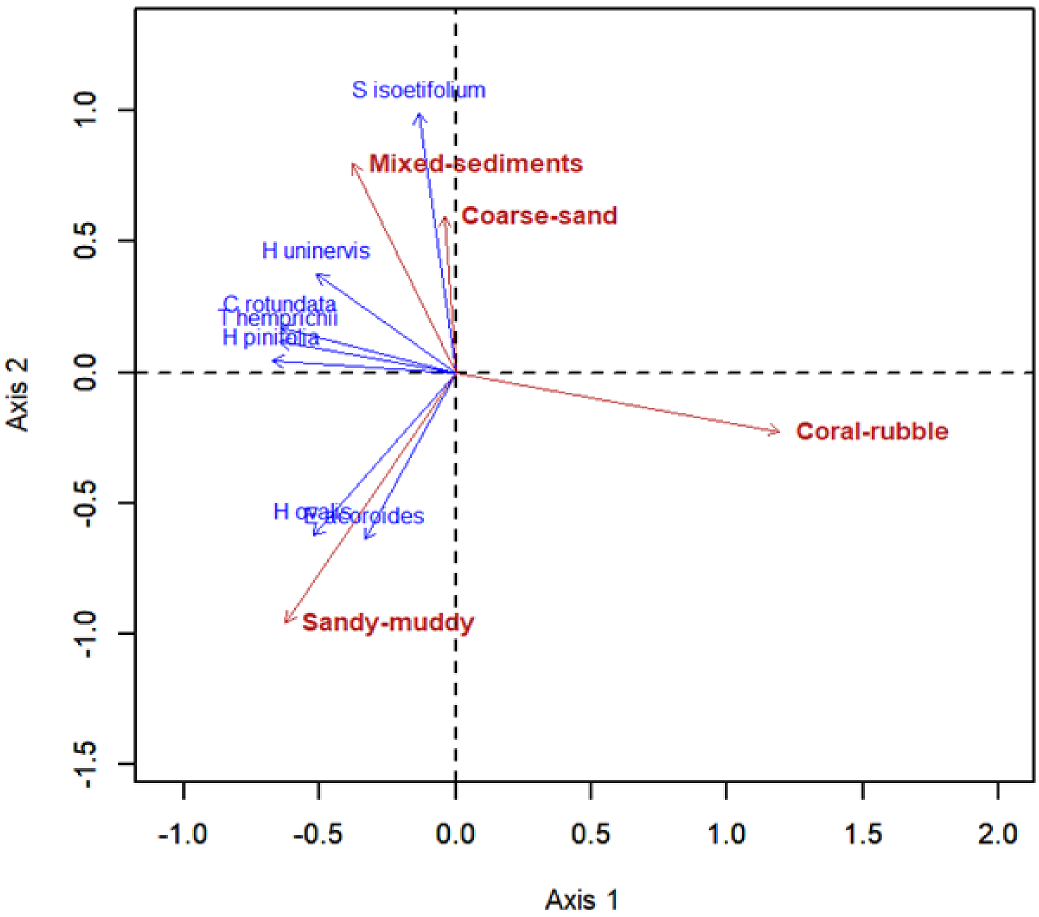

Figure 8. Principal Component Analysis (PCA) showing the relationship between seagrass species (blue arrows) and sediment types (red arrows) at Barangay Poblacion, Malay, Aklan.

Seagrass species diversity and evenness

The Shannon-Weiner Diversity index (H' =1.52) indicated moderate to high species diversity within the seagrass meadows of Barangay Poblacion, Malay, Aklan. The Peilou's Evenness index (J' =0.78) suggested uneven distribution of seagrass species abundance, with dominance by one or more species, notably *C. rotundata* and *T. hemprichii.*

DISCUSSION

This study represents the first scientific assessment of the composition, diversity, frequency, distribution, and abundance of seagrass species in Poblacion, Malay, Aklan. The people of Malay are traditionally farmers and fishers, and tidal flats are essential in their livelihoods, providing grounds for gleaning and many other capture fishing activities. "Eusay", the local Malaynon term for seagrasses, plays a vital role in the livelihood of locals, such as gleaning, spearfishing, and other capture fishing activities, which aid in food security; highlighting the socio-ecological relevance of this study to the local community. The recorded seven seagrass species represent 38.9% of the total seagrass species found in the Philippines (Short et al., 2011; Fortes, 2015). Globally, there are approximately 72 seagrass species (Reynolds, 2018), 18 of which occur in the Philippine archipelago (Fortes, 2013), but recent studies identified a lesser number of species, around five in Palawan and six in Cebu (Cayetano et al., 2025; Melendres, 2025). Generally, this signifies that different seagrass species can thrive and co-inhabit in an intertidal flat, forming mixed seagrass meadows similar to those reported in other parts of the Philippines, such as Gingoog City, Misamis Oriental (Molina and Bersaldo, 2024); Bonggao, Tawi-Tawi (Abubakar and Echem, 2018); Hagonoy, Davao del Sur (Jumawan et al., 2015); and Lubang and Looc Islands in Oriental Mindoro (Genito et al., 2010).

The percentage cover data revealed that *C. rotundata* had the highest overall cover (34.48%), followed by *T. hemprichii* (32.53%), identifying these as dominant species in the study area. In contrast, *H. ovalis* has the lowest cover (1.41%). Meanwhile, a similar dominance was observed with *T. hemprichii* and *C. rotundata* in a study conducted on the southwest coast of Davao Oriental (Capin et al., 2021). The recorded dominance may be due to the growth of rhizomes, which enables the space occupation and expansion of seagrass species (Rollon et al., 2001; Genito et al., 2010; Zulfikar et al., 2019). These dominant species are ecologically important in the meadows, as they contribute more to the sediment stability, influence energy flow and nutrient cycling (Odum 1971). Additionally, the presence of *T. hemprichii* and being the second most dominant species in the area indicates its ecological importance as food for green sea turtle, highlighting its conservation importance (Kelkar et al., 2013). Conversely, the limited cover of *H. ovalis* is attributed to its limited space occupancy and competitive ability along with the other species (Molina and Bersaldo, 2024).

The high frequency and relative frequency of both *C. rotundata* and *T. hemprichii* are due to their consistent presence in every quadrat, implying their dominance. This corresponds to their respective competitive advantages in occupying space, which reduces availability for other species, hence influencing overall biodiversity and community stability (Odum, 1971; Duarte, 2000; Abubakar and Echem, 2018).

The observed zonation pattern along depth profiles is primarily influenced by sediment type, light penetration, and nutrient availability. The high cover of *C. rotundata* and *T. hemprichii* was consistent across depth intervals, indicating high adaptability to varying environmental conditions and suggesting ecological resilience (Genito 2010). However, a pattern of declining cover was observed in relation to coarser sediments; this species includes *H. pinifolia*, *H. uninervis*, *H. ovalis*, and *E. acoroides*. Studies have reported that seagrass species exhibit substrate preference—either in sandy or muddy types, which may also indicate opportunistic colonization strategies (Piñeiro-Juncal et al., 2022).

The Principal Component Analysis revealed the correlation between seagrass dominance and sediment types: *H. ovalis* and *E. acoroides* were associated with a sandy-muddy substrate, whereas S. isoetifolium was associated with mixed and coarse-sand sediments (Lamit and Tanaka 2019). In contrast, coral rubble sediments (Notably in quadrat 5, 40-50 m) supported no seagrass species, indicating sediment type as a key limiting factor (Swadling et al., 2025). This signifies that various physico-chemical parameters and anthropogenic activities may greatly affect the distribution of seagrass species (Molina and Bersaldo, 2024). Coastal developments and excessive tourism-related activities pose a threat as major drivers of possible sedimentation in the nearshore habitats such as seagrass meadows (Cabaço and Santos 2007, Fortes et al., 2018). Recent flooding may cause an increase in sediment due to the upland development, including windmills and proposed hydrological dam constructions. This will have more soil erosion and sediment runoff to the coastal areas. Although tourism activities in Boracay Island do not directly affect the study site, this holds pressure for economic developments in the mainland, which possibly affect the study site in the near future. Despite adequate light and minimal disturbance, unfavorable substrates can restrict seagrass establishment, as previously noted by Abubakar and Echem (2018). These findings highlight the need for management schemes to prevent further damage in seagrass meadows through sediment control and watershed management. The sediment and flooding control strategies must be included in the local coastal planning and regulating the possible upland developments to ensure sound land use for seagrass meadow protection.

The computed Shannon-Weiner Diversity index (*H'* =1.52) indicates moderate to high diversity, while Peilou's index of evenness (*J'* =0.78) suggests uneven species distribution and zonation linked to substrate preference. Such diversity patterns may result from both natural and anthropogenic disturbances, which generate habitat heterogeneity (Duarte, 2000). Low seagrass evenness is a potential drivers of ecological imbalances due to natural or anthropogenic pressures that causes habitat degradation, possible eutrophication, or fragmentation (Morris et al., 2014; Karrouch et al., 2017; Rodil et al., 2022; Cayetano et al., 2025). Low evenness means the dominance of one seagrass species, resulting in a less diverse meadow with lesser ecological functions, and potentially reducing the complexity and stability of local food webs (Cui et al., 2021; Mascariñas and Otadoy, 2022). The disproportionate dominance may lessen the meadow's capacity for efficiency in carbon sequestration from biomass itself and in sediment trapping. It is reported that a diverse seagrass meadow is more stable and contains the largest and most efficient carbon storage (Bijak et al., 2023). However, the relatively low total species count (n=7) compared to the 10-species threshold proposed by Alcala et al. (2008) suggests that these meadows are only moderately diverse. Low diversity dominated by a few species may imply reduced ecological stability and resilience (Abubakar and Echem, 2018). The low seagrass diversity may indicate that the meadow is affected by various environmental disturbances; higher diversity means less disturbances (Duarte 2002; Molina and Bersaldo, 2024). This low diversity can reduce the meadow's capacity to withstand or recover from disturbances such as flooding, turbidity, or sedimentation, among others. A diverse seagrass meadow will have a functionally diverse response towards any limitations or disturbances, enabling the meadow to recover or survive faster (Hughes and Stachowicz, 2004; Christianen et al., 2023). Collectively, the findings suggest that seagrass abundance, diversity, and distribution at Población, Malay, Aklan, are strongly shaped by sediment composition and environmental variability. Future studies should integrate ecological function indicators (e.g., biomass, productivity, and faunal associations) to strengthen the understanding of seagrass ecosystem services and resilience. This highlights the importance of this baseline study; the establishment of current seagrass status and meadow condition can be a reference in the formulation of science-based management schemes, policies, and conservation actions, such as continuous monitoring and identifying priority areas for protection, especially from sedimentation and other anthropogenic activities. This will continue to ensure the sustainability of the seagrass meadow ecosystem, marine biodiversity, and the livelihood of coastal communities.

CONCLUSION

In this study, a total of seven seagrass species were identified, namely *Halodule pinifolia*, *Halodule uninervis*, *Syringodium isoetifolium*, *Cymodocea rotundata*, *Enhalus acoroides*, *Thalassia hemprichii*, and *Halophila ovalis*, with *C. rotundata* being the most dominant species in terms of abundance (percent cover) and frequency. *Cymodocea rotundata* and *T. hemprichii* tend to thrive in a wide range of sediment types, while other species showed depth-related preferences influenced by sediment characteristics. The Shannon-Weiner diversity index and Pielou's evenness index revealed that seagrass species in this study are moderately to highly diverse, but not evenly distributed, thus exhibiting clear zonation patterns. However, literature indicates that a meadow with only seven recorded species may not yet represent a fully developed or highly resilient seagrass community, as greater species richness is often associated with enhanced ecological stability and ecosystem services. The importance of sediment type, depth, and adaptability of species as factors influencing seagrass diversity and distribution in the coastal environment of Barangay Poblacion, Malay, Aklan, is highlighted in this study. This paper recommends the implementation of management schemes for conservation, protection, and sustainable management by the local government unit, through collaboration with local stakeholders. Such actions will contribute to strengthening marine biodiversity, enhancing ecosystem resilience, and advancing the goals of Sustainable Development Goal 14 (Life Below Water).

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AUTHOR CONTRIBUTIONS

J. D. O: Conceptualization, data collection, analysis of data and visualization, writing and draft preparation of manuscript; M. M. I: Data curation and validation, supervision, manuscript revisions, and editing.

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DECLARATION

Informed consent statement

This study follows ethical standards in data collection by securing permits from local concerned offices. Proper health protocols were followed during the conduct of this study amidst COVID-19 restrictions.

Conflict of interest

The authors of this study affirm that they have no conflicts of interest.

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