



## Identification of seagrass species in the Lakeba Coastal Intertidal Area, Baubau City

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### ABSTRACT

Lakeba beach is a beach located in the city of Baubau and has an intertidal zone overgrown by several types of aquatic plants in the form of seaweed called seagrass. The purpose of this study was to determine the types of seagrasses in the intertidal zone of Lakeba Beach, Baubau City. The type of research used is qualitative research with the method used being a direct survey to a location with a transect of 200 meters and a width of 50 meters and conducting interviews with two respondents. The results found on the lakeba beach consisted of 2 orders, 2 families, and 5 seagrass species. Order Helobiae and Alismatales, family *Hydrocharitaceae* and *Cymodoceae*. Furthermore, the species found were *Enhalus acoroides*, *Halophylla ovalis*, *Halodule uninervis*, *Halophylla spinolosa*, and *Cymodocea rotundata*.

## 1. Introduction

One very unique part of the beach is the intertidal zone which is overgrown by plants called seagrass [1]. The intertidal zone is a dynamic zone, which is influenced by changes in tides and ebbs that make the environmental conditions unstable, causing changes to the habitat where seagrass lives [2]. The intertidal zone is the area between the highest and lowest tides of seawater, which represents the transition from ocean conditions to land conditions. The area of the intertidal zone is very limited but has very varied environmental factors, so it has a high diversity of organisms, one of which is seagrass (*seagrass*). The importance of seagrass habitat in the marine environment is as a habitat for various types of marine life. The availability of information on seagrass species is still a big shortage, so it is necessary to continue to develop methods and activities for mapping seagrass ecosystems [3].

Seagrass is one of the ecosystems that are very sensitive to environmental changes, global decline, and threats from various factors caused by humans [4]. Seagrasses have an important role in ecology and economy [5]. The ecological functions of seagrasses include: a breeding ground (spawning ground), a food source (feeding ground), and producing oxygen and reducing CO<sub>2</sub>. While the economic function of seagrass is as a fish catchment area, because the presence of seagrass can increase fish productivity [6]. Seagrass is a plant that is fully adapted to be able to live in the marine environment. The existence of seagrasses in the sea is the result of several adaptations carried out including tolerance to high salt levels, the ability to anchor roots in the substrate as anchors, and also to grow and reproduce when immersed [6].

Seagrass is a type of higher plants (Anthophyta) whose habitat grows immersed in the marine environment; vascular, rooted (rhizome), and reproduce generatively (seeds) and vegetatively [7]. Seagrass is one of the primary producers in trophic structures that produce organic matter through the process of photosynthesis and is the key role of seagrass [8].

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Lakeba Beach in Baubau City, which is close to community settlements, and a tourist spot, so that the seagrass beds are disturbed due to human activities. Based on this, it is important to conduct a study entitled "identification of types of seagrass in the intertidal area of Lakeba Beach, Baubau City".

## 2. Material and Method

### 2.1 Tools and materials

The tools used in this research are: camera, roll meter, stationery, and raffia rope. While the ingredients are alcohol and jars used to preserve the sample.

### 2.2 Field observation

Field observations were carried out to determine the state of the research location. Observations are made by determining the transect point to be made.

### 2.3 Data collection

This research is qualitative research with a direct survey approach to the location. The identification process is carried out by making a transect of 200 meters and a width of 50 meters. Furthermore, the seagrass that was on the transect was taken and brought to the laboratory for comparison. The comparison results are recorded and documented.

### 2.4 Data analysis

The data analysis used in this study was descriptive analysis to obtain an overview of the types of seagrass found and to determine the species found on the Lakeba coast.

## 3. Results and Discussion

Based on the results of the research conducted, there are five types of seagrass plant species that exist in the intertidal zone of the lakeba coast as listed in Table 3.1.

Table 3.1 types of seagrass

No	Latin name	Indonesian name	Region Name
1.	<i>Enhalus acoroides</i>	Lamun tropika	Rondo
2.	<i>Halophila ovalis</i>	Lamun bentuk oval	Lela
3.	<i>Halodule uninervis</i>	Lamun jarum	Lamun
4.	<i>Halophila spinulosa</i>	Lamun daun majemuk	Lamun
5.	<i>Cymodocea rotundata</i>	Lamun berujung bulat	Lelaam

Seagrass is a true plant that lives in the sea. Seagrass belongs to the subclass Monocot class Angiosperms or flowering plants. True plants, are structurally and functionally similar with land grass on its morphological characteristics such as: leaves, stems, roots and root structure reproduction (flowers and leaves) [9]. The most specific seagrass genus is *Halophila*, with at least 7 species (*Halophila beccarii*, *H. decipiens*, *H. major*, *H. minor*, *H. ovalis*, *H. sulawesii* and *H. spinulosa*) known to occur in Indonesia. Reported from Malaysia to eastern Australia, *Halophila spinulosa* is a tropical seagrass that lacks data [10]. Lakeba Beach, which is located in the Katobengke Village, Baubau City, has a long coastline, this beach includes sandy and rocky beach species that have tidal areas (Intertidal zones) which are overgrown with seagrass. This research has been carried out in the intertidal zone of the Lakeba coast, Baubau City. The research location is limited to a length of 200 meters, and a width of 50 meters at the lowest low tide. Based on the survey results found five types of seagrass (as listed in table 3.1) can be seen in table 3.1.

### 3.1 *Enhalus acoroides*

This species is the most common species, widely found, very easy to identify and larger in size when compared to other seagrass species. This species was found throughout the observations. The characteristics of this type of seagrass are having thick leaves, elongated leaf shape like a ribbon with a round apex. Figure 1 shows one of the seagrass species identified as *Enhalus acoroides*. This species has 3-4 leaves on one stalk. *Enhalus acoroides* is a species of tropical seagrass that contains a lot of cellulose and hemicellulose. During the rainy season, the leaves of this species are washed along the coast, accumulate, and decompose anoxically, causing an unpleasant odor. This leaf waste can be utilized by extracting cellulose fibers. The finished leaf

waste is treated with alkaline and bleached [11]. Stands with leaf length ranging from 2.0 to 70.5 cm and width from 0.6 to 0.8 cm. Rhizomes measuring between 1 - 8.3 cm, in this section are also covered by thick black coir, besides that brownish white roots are measuring 1 - 27.7 cm (roots and rhizomes are not removed).

Kingdom : Plantae  
 Phylum : Anthophyta  
 Class : Angiospermae  
 Subclass : Monokotyledonae  
 Order : Helobiae  
 Family : Hydrocharitaceae  
 Genus : *Enhalus*  
 Species : *Enhalus acoroides*

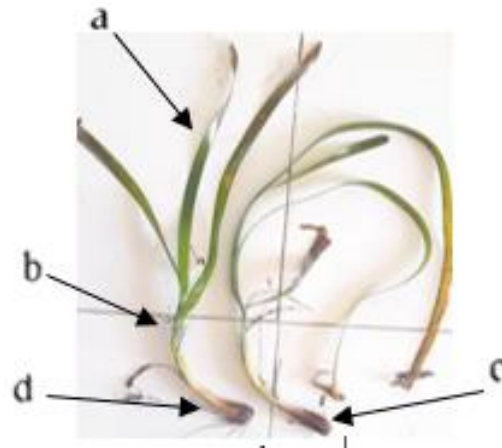


Figure 1. *Enhalus acoroides* (a) leaf; (b) stem and midrib; (c) rhizoma; (d) black coir

### 3.2 *Halophila ovalis*

The characteristics of this type of seagrass have a pair of leaves that are oval or oblong, with a round leaf tip or apex. In each stand found a pair of shoots called lutsinar, which is located at the base (node) which is located between the stem and rhizome. The length of the rhizome is 0.2 - 7.5 cm while the length of this luminary is in the range of 0.2 - 0.6 cm. The leaf length of *H. ovalis* ranges from 0.2 to 1 cm with a leaf width of 0.3 to 0.9 cm. The number of leaf bones (cross-veins) is 5-19. In addition, *H. ovalis* also has petiolate petioles with a length of 0.2 - 1.6 cm and roots of 0.3 - 4 cm. General characteristics of this family include the leaves tend to be branched 2, the leaves do not have ligules like those of the Potamogetonaceae family, the leaf shape is linear (straight), round, oval, sessile or enlarged branched with parallel fingers connected by cross channels. decreased or pendicular [12]. *Enhalus acoroides* classification is as follows [13].

Kingdom : Plantae  
 Phylum : Tracheophita  
 Class : Magnoliopsida  
 Order : Alismatales  
 Family : Hydrocharitaceae  
 Genus : *Halophila*  
 Species : *Halophila ovalis*



Figure 2. *Halophila ovalis*

### 3.3 *Halodule uninervis*

*Halodule uninervis* is a flowering plant commonly known as needle seagrass. *Halodule uninervis* is widely distributed in the Indo-Pacific region. In the Indian Ocean, found from Geographe Bay in Western Australia. It is a euryhaline species that can tolerate high salinity, grow, reproduce and complete its entire life cycle underwater in submerged conditions. *Halodule uninervis* was found to be rich in phenolic and phenylpropanoid derivatives such as p-coumaric acid, caffeic acid, p-hydroxybenzoic acid, and vanillic acid. Since seagrasses are known to produce unique secondary metabolites as a defense mechanism, much research has been devoted to this species in search of powerful new antioxidants or antibiotics [14]. By the results of the identification of this species has the following morphological characteristics: Rhizome with nodes with 8,6 cm long internodes, 2.6 cm long frond or petiole, In each buku, there are 2 roots and shoots, 19.7 cm long leaf blade, and 0.2 mm wide, found on sandy substrate. *Halodule uninervis* is found in the Intertidal Zone to a depth of 30 meters on sandy substrates.

Kingdom : Plantae  
 Phylum : Trakeofit  
 Class : Angiospermae  
 Subclass : Monokotil  
 Order : Alismatales  
 Family : Cymodoceaceae  
 Genus : *Halodule*  
 Species : *Halodule uninervis*



Figure 3. *Halodule uninervis*

### 3.4 *Halophila spinulosa*

The identification of this species has the following morphological characteristics: Leaves are elliptical, and each leaf collection consists of 10-25 opposing leaves, sharp leaf edges, thin rhizomes, and sometimes "woody". *H. spinulosa* is dioecious, The plant has a horizontal rhizome being non-flowering and flowering erect shoots. Plants with floweringslrhots bearing either male or female flowers have similar appearance and morphologt [15]. The genus *Halophila* has more than twenty described species and most of them are spread over a wide geographic area along the tropical and warm temperate coastlines of the Indo-West Pacific Ocean. Based on the reproductive and vegetative morphology, the genus is divided into eight sections including three new sections: the Australes section, the Stipulaceae section and the Decipientes section [16].

Kingdom : Plantae  
 Phylum : Spermatophyta  
 Class : Liliopsida  
 Order : Alismatales  
 Family : Hydrocharitaceae  
 Genus : *Halodule*  
 Species : *Halodule spinalosa*



Figure 4. *Halophila spinalosa*

### 3.5 *Cymodocea rotundata*

*Cymodocea rotundata* is a type of seagrass that dominates most of the lakeba coast. Previous studies reported that *Cymodocea rotundata* was the predominant species and had the highest occurrence frequency of 89.9% [17]. In accordance with the results of the identification of this species has the following morphological characteristics: Rhizome segmented 2 cm long, leaf midrib or petiole 3.1 cm long, each buku consists of 1-3 roots and long shoots, leaf blade length measuring 11 .2 cm long and 0.5 cm wide, Lives on muddy and sandy substrates. Based on the results of the identification of morphological characteristics after being matched with the characteristics.

Kingdom : Plantae  
 Phylum : Arthropyta  
 Class : Angiospermae  
 Subclass : Monokotiledonea  
 Order : Helobiae  
 Family : Cymodoceae  
 Genus : *Cymodocea*  
 Species : *Cymodocea rotundata*



Gambar 5. *Cymodocea rotundata*

#### 4. Conclusion

Based on the research results, it can be concluded that the seagrasses found on the Lakeba coast consist of 2 orders, 2 families and 5 species. The orders found on the lakeba coast are the Helobiae and Alismatales orders, the families found are the Hydrocharitaceae and Cymodoceae families. Furthermore, the species found were *Enhalus acoroides*, *Halophila ovalis*, *Halodule uninervis*, *Halophila spinulosa*, and *Cymodocea rotundata* species.

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