# Preliminary Notes of Seagrasses from Pulau Besar, Johor

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## Introduction

Seagrasses are a type of plant that have evolved from terrestrial and have become specialized to live in the marine environment (Short et al. 2001). The structures of seagrasses are just like terrestrial plants with leaves, roots, conducting tissues, flowers and seeds, and produce their own food using photosynthesis. The seagrass blades are supported by the neutral buoyancy of water and remaining flexible when exposed to waves and currents while terrestrial plants need strong and supportive stems to overcome the force of gravity on land. Sometimes, seagrasses are also confused with marine macroalgae. Further examination reveal that seagrasses posses true root that anchor to substrate, extracting minerals and other nutrients from the sediment. Most seagrasses also have separate sexes and produce flowers and seeds with embryos developing inside ovaries.

Seagrass beds provide nursery areas, habitat for fish and shellfish, and food for herbivores such as dugong and sea turtles. Additionally, they filter suspended sediments and nutrients from coastal waters, dissipate wave energy and stabilize sediments. Coastal communities experiencing a loss of seagrasses also lose the ecosystem services that seagrass beds provide (Orth et al., 2006). A wide variety of factors can adversely influence seagrass ecosystems, including commercial dredging, food collection or dynamite fishing, removal of herbivores, and increased storm intensity attributable to climate change (Freeman et al. 2008). Seagrasses perform a variety of functions within ecosystems, and have both economic and ecological value.

Along 4800 km coastline of Malaysia, stretching along the Malay Peninsula, Sabah and Sarawak and bounding much of the southern part of the South China Sea, are various environment with coastal habitat; mangroves, coral reefs and seagrasses. In general along the mainland, coastal areas between mangroves and corals (from low tide level to

the coral reef fringe) form the habitats for seagrasses (Japar et al. 2006). Seagrass beds supports both commercial and recreational fisheries that provide a wealth of benefits to the state's economy Thus the identification and mapping of seagrasses are very important for further studies and comparison in the growth of development. In this study, we collect seagrasses samples as our preminilary result.

## Materials and Methods

The sampling locations for this study are specialist on Pulau Besar. Survey had been conducted randomly at four locations (Figure 1) in 18 to 19 November 2008 with the depth around 3 to 5 meters. Samples of seagrass were collected during Scuba diving and brought up to be sorted out according to their similar morphological feature. The specimens were generally classified at field based on Phillips & Menez (1988). The samples were rinsed in freshwater and blotted dry on newsprint. The specimens were photograph before pressed fresh and preserve. The specimens were brought back to laboratory, and were further identified according to Kuo & Hartog (2001). The specimens were dry, place and affix on herbarium paper and a complete notation of each specimen were mounted with the specimen.

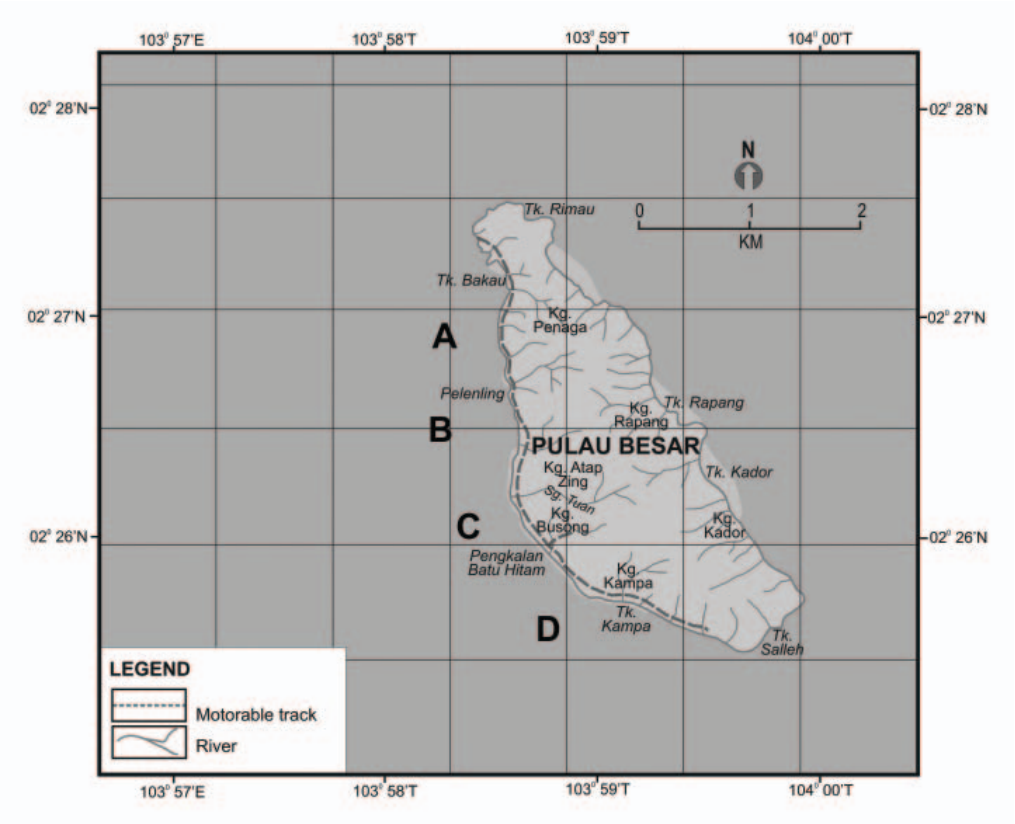


FIGURE 1: The Sampling Location from Four Locations in 18 to 19 November 2008

# Result and Discussion

The seagrasses that were collected during this sampling were *Halophila ovalis, Halodule uninervis, Cymodocea serrulata, Thalassia hemprichii,* and *Syringodium isoetifolium* (Figure 2). The brief morphological description as Kuo & Hartog (2001) are:

1. *Halophila ovalis* (Figure 2A)

Dioecious. Rhizomes internodes and petiole up to 10 cm long. Leaf blade varies in shape from oblong-elliptic, spatulate, obovate, to ovate, rarely linear, 10-40 mm long, 5-20 mm wide, with 10-28 often branched cross veins at either side of the midrib. Male flowers with tepals 3-5 (-6) mm, anthers 1.5-2.5 mm long. Female flowers with 3 styles, 10-40 mm long. Fruits 3-6 mm in diameter. Seeds subglobose. This species is the most common seagrass in the tropical and subtropical regions of the Indo-West Pacific and inhabits various environments, resulting in considerable morphological variation.

2. *Halodule uninervis* (Figure 2B)

Leaf blades up to 15 cm long and 0.25-3.5 (-5) mm wide; apex tridentate with a short central tooth and well-developed lateral teeth. Male flower on a stalk of about 6-20 mm length, anther 2-3 mm with 0.25-0.5 mm in anther height difference. Female flower with a single style, 28-42 mm long. Fruit subglobose to ovoid 2-2.5 mm by 1.75-2 mm. two distinct morphological forms can be recognized in this species; a wide-leaved and a narrow-leaved (less than 1 mm width) form which often occur in the same area. The wide-leaved form mainly grows in the marine environment, while the narrow-leaved form is found both in marine and brackish water.

3. *Cymodocea serrulata* (Figure 2C)

Rhizome with 2-3 sparsely branched roots at each node and a short erect stem bearing 2-5 leaves. Leaf sheath broadly triangular, narrow at the base, when shed leaving an open circular scar on the erect stem. Blades linear to falcate, up to 15 cm long, 4-9 mm wide, with 13-17 longitudinal veins, apex obtuse, serrate to dentate. Fruit elliptic in outline, laterally compressed, 7-9 mm long, 3.75-4.5 mm wide, 2 mm thick, dorsal side with 3 parallel, blunt ridges. This species usually grows together with *C.rotundata*, but can be distinguished from the latter species by having a triangular leaf sheath, when shed leaving open scars on the erect stem; the leaf blades of this species have also more longitudinal veins (13-17) and an obtuse serrated apex.

4. *Thalassia hemprichii* (Figure 2D)

Lead blades 10-40 (-100) cm long, 4-11 mm wide, with 10-17 longitudinal veins. Male peduncle 3 cm long; pedicel 2-3 cm long, tepals 7-8 mm long, stamens 3-12, anthers oblong, occasionally forked, 7-11 mm long. Female flower with 6 styles eeach with 2 stigmata 10-15 mm long. Fruit globose, roughly echnate, 2-2.5 cm long, 1.75-3.25 mm wide, bursting open into 8-20 irregular valve; beak 1-2 mm.

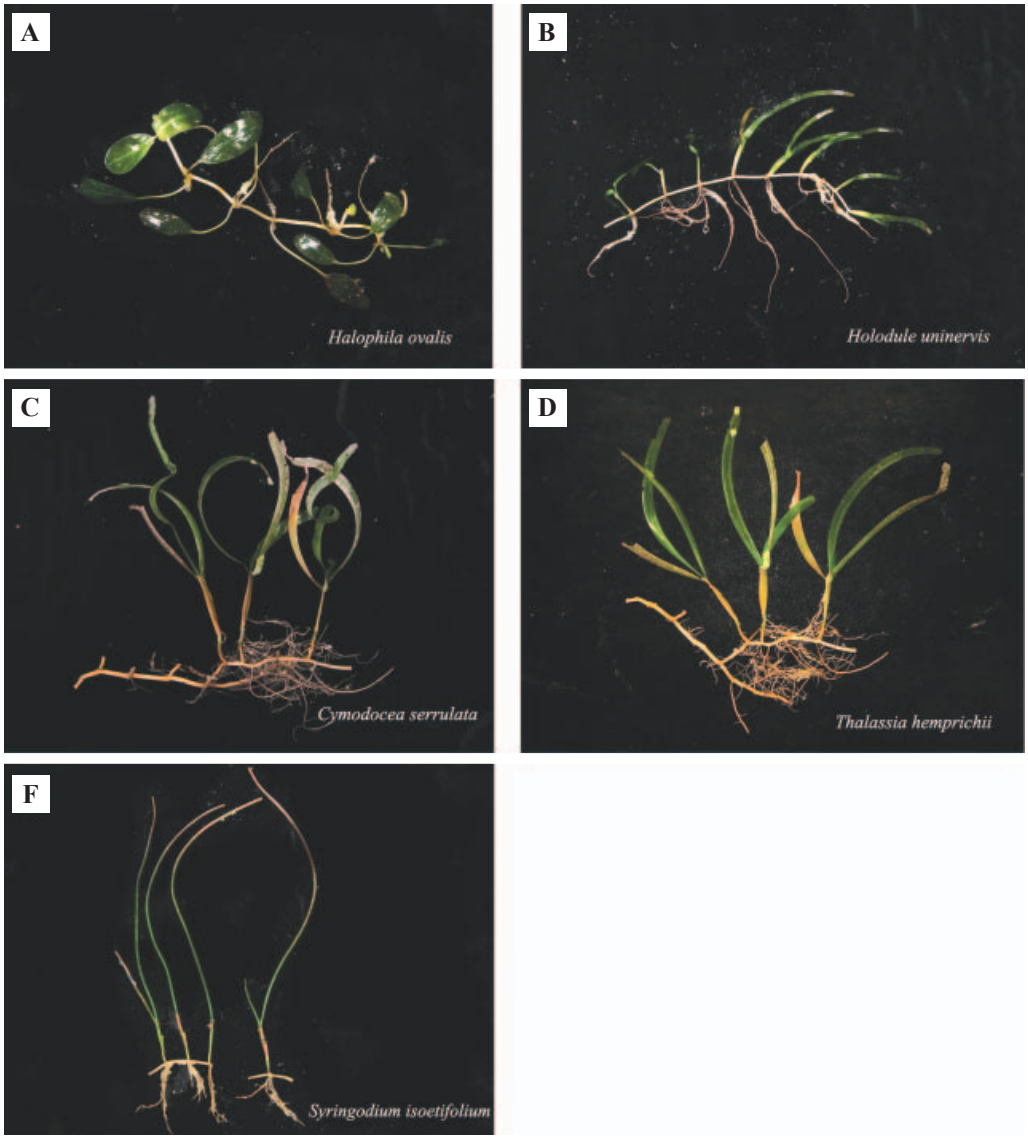


FIGURE 2: The seagrasses That were Collected During This Sampling were (A) *Halophila Ovalis,* (B) *Halodule uninervis,* (C) *Cymodocea serrulata,* (D) *Thalassia hemprichii,* and (E) *Syringodium isoetifolium*

5. *Syringodium isoetifolium* (Figure 2E)

Rhizomes with 1-3 little branched roots and an erect shoot bearing 2-3 round leaves at each node. Blade up to 30 cm long, 1-2 mm diameter, with 7-10 (-15) peripheral veins, which have a considerably smaller diameter than the central vein. Fruit oblique ellipsoid, 3.5-4 mm long, 1.75-2 mm wide, 1.5 mm thick.

In this study, five species of seagrasses have been identified. Comparing to the seagrasses noted in Japar et al (2006) during his work around Malaysia between 1994 to 2004, They also found different combination of five species of seagrasses in Pulau Besar. Combining both results, there are a total of seven species of seagrasses in the list from Pulau Besar. The species of seagrasses found in Pulau Besar are *Halophila ovalis, Halodule uninervis, Cymodocea serrulata, Thalassia hemprichii, Syringodium isoetifolium, Halophila spinulosa* and *Cymodocea rotundata.*It shows that Pulau Besar have half of the total seagrass species found in Malaysia.

Human consumption of seagrass is not entirely confined to the past; seeds of *E. acoroides* are consumed by the coastal communities of Sungai Pulai, Johore. The nutritional value of the flour derived from *E. acoroides* seeds is comparable to that of wheat and rice flour in terms of carbohydrate, protein and energy values, and surpasses these other types of flour in calcium, iron and phosphorus (Montano et al. 1999). During this survey, we also recorded a variety of other marine organisms living in this seagrass beds. For examples sea cucumber, sea urchins, fishes, anemones, corals, and turtles. Presently dugongs are found mostly in areas with abundant seagrasses such as Pulau Sibu, Pulau Tengah, Pulau Besar and Pulau Tinggi on the east coast and around Tanjung Adang-Merambong shoals of Sungai Pulai, Johore (Japar & Muta, 2002). Few areas of dugong feeding were seen during this survey. The management of seagrass resources requires efforts directed towards identifying, understanding and solving the natural and man-induced changes to seagrass resources. In conclusion, more works and survey are needed to fully understand the biodiversity and importance of seagrass bed.

## Acknowledgement

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