

## A New Record of Seagrass *Halophila beccarii* Ascherson in Bangladesh<sup>†</sup>

Abu Hena Mustafa Kanal<sup>1\*</sup> and F. Short<sup>2</sup>

<sup>1</sup>*Institute of Marine Sciences and Fisheries, University of Chittagong, Chittagong 4331, Bangladesh*

<sup>2</sup>*Jackson Estuarine Laboratory, Department of Natural Resources, University of New Hampshire, 85 Adams Point Road, Durham, NH 03824, USA*

\*Corresponding author. E-mail: [hena71@yahoo.com](mailto:hena71@yahoo.com)

### ABSTRACT

*The seagrass Halophila beccarii Ascherson was collected from the intertidal area of Bakkhali estuarine environment, situated at Cox's Bazar in the south-east coastal area of Bangladesh. Seagrass H. beccarii was found in an accrete area and co-existed with mangroves (Avicennia alba and A. marina) and salt marsh (Porteresia coarctata) and scattered sparsely in the salt marsh habitat and macroalgae Ulva intestinalis. The morphological structures, especially vegetative, distribution and environmental parameters are discussed. The discovery of H. beccarii from the vicinity of Bakkhali estuarine environment is a new record and increases the number of published seagrasses species known in Bangladesh waters to three.*

**Key words:** Seagrass, *Halophila beccarii* Ascherson, Bakkhali estuary, Bangladesh

### INTRODUCTION

The coastlines of Bangladesh are highly productive in terms of nutrient input from different sources that promote other living resources. These coastal areas are comprised of a variety of aquatic macrophytes. Among these macrophytes, seagrasses grow in the intertidal and littoral zone in the coastal area of Bangladesh (Islam and Aziz, 1980; Islam, 1997). The coastlines and estuarine coastal water-logged areas of Bangladesh harbor at least four species of seagrass; *Halodule uninervis* (Forsskal) Ascherson, *Halophila decipiens* Ostenfeld, *Ruppia maritima* Linnaeus and *Halophila pinifolia* (Miki) Den Hartog (Islam and Aziz, 1980; Islam, 1997; Abu Hena 2006 and Abu Hena unpublished data). In February 2006, another seagrass, *Halophila beccarii* Ascherson was found in the intertidal

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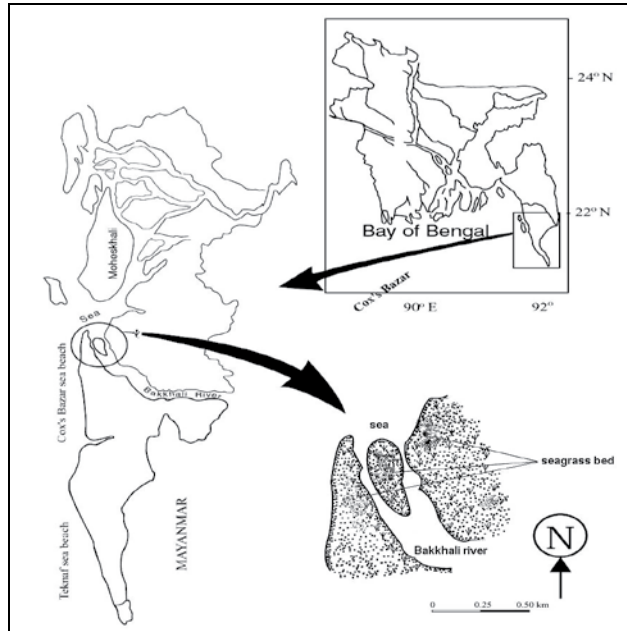
area of Bakkhali river estuary, Cox's Bazar. The occurrences of this seagrass appear to be very rare and have not been recorded in any other coastal area of Bangladesh. It is surprising to note that the colonization of this estuarine spoon grass along the coast of Bakkhali river estuary is a recent phenomenon. This paper describes the vegetative structures of the plant as well as notes its distribution and environmental parameters.

## MATERIALS AND METHODS

The seagrass *Halophila beccarii* specimens were collected from the intertidal area in the vicinity of Bakkhali estuarine environment physically by the authors during the field visit in February 2006 (Fig 1). The study area is situated at 20° 85' 40"–20° 46' 92" N latitude and 91° 96' 60"–92° 34' 37" E longitude. Materials were processed for herbarium specimen as described by Waycott et al., (2004) and some were preserved in 4% formalin in saline water for further examination. All specimens are currently kept by the first author.

### Collection and Analysis of Environmental Parameters

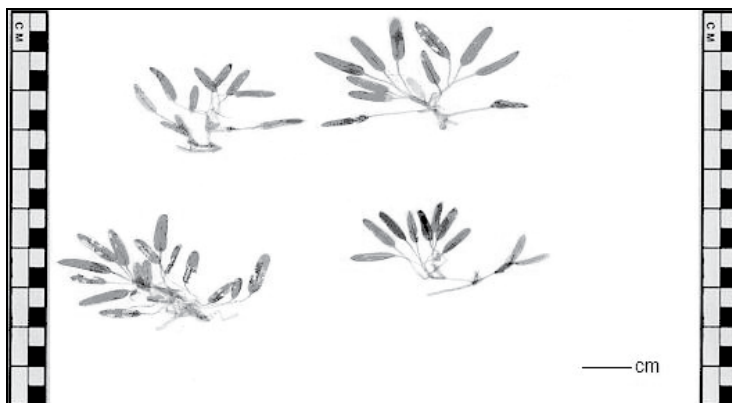
During the study period, the water temperature, transparency and water salinity were measured *in situ* using mercury thermometer, Secchi disk (30 cm in diameter) and salinity refractometer (0–100%, OSK, Japan), respectively. Soil samples of seagrass bed were collected using a mud corer, placed in the plastic bags and labeled. After collection, all samples were brought back to the Laboratory of Estuarine, Coastal and Aquaculture Research (LECAR) within 2–4 h for analysis. In the laboratory, the samples were dried at 100°C for 24 h and powdered, sieved through a 0.5 mm stainless steel sieve and kept in a desiccator for further analysis. The texture of the soil was analyzed following the procedure described by Bouycous (1962).



**Figure 1:** Location of the study area showing the seagrass *H. beccarii* bed.

**Morphology of *Halophila beccarii***

The morphology of *H. beccarii* is distinctive, having each of the shoot carries 4-8 leaves. Erect plants arise from branching slender rhizomes. Rhizome is observed to be about 1 mm in diameter with internodes 1.0-3.0 cm long with one root per node. Leaf of this plant is found to be lanceolate in shape, apex acute, base attenuate and length 1.0-2.5 cm. The width of the leaves is about 2.0 mm and sometimes has minutely-serrated edges. Leaf has three longitudinal veins without cross veins and the blade is borne on a petiole up to 3.0 cm long (Plate 1).



**Plate 1:** *H. beccarii* Ascherson from the coastal intertidal area of Bakkhali river estuary, Cox’s Bazar.

### **Distribution and Habitat**

The geographical distribution of this species is most interesting. The species is widely distributed in the Indo-West Pacific region between Tropic of Cancer and the Equator, covering countries like India, Sri Lanka, Myanmar, Vietnam, Philippines, Singapore, Hong Kong and Malaysia (Den Hartog, 1970; Morton and Wu, 1975; Japar Sidik et al., 1995). It is also collected newly from the estuarine and coastal habitat of Cox's Bazar, Bangladesh as a part of Bay of Bengal by the authors in 2006. It is a new record for Bangladesh.

The seagrass *H. beccarii* grows both as an annual and a perennial. It may grow to form dense mono-specific meadows or may grow with other coastal aquatic plants like salt marsh (*Porteresia coarctata*) and seaweed (*Ulva intestinalis*) in the estuarine intertidal habitat. Sometimes it grows in mangrove (*Avicennia alba* and *A. marina*)-dominated sites. On sandy bottoms with an admixture of mud, the species is often accompanied by *H. ovalis*, even *H. ovata* or *Halodule uninervis* can be found in this community elsewhere (Den Hartog, 1970). The range of the recorded water temperature was 21.0-29.5°C during the study period in the seagrass bed of *H. beccarii*. The water salinity ranged from 16.0–35.0‰ and fluctuated during the study period. This value is comparable with the reported values by Mahmood (1986). The fluctuations of transparency (30.0-55.0 cm) in this estuarine water could probably be due to the circulation pattern and fresh water discharge which is dependent on the monsoonal activities. The transparency in any coastal water also depends on the quality and amount of sediment in the river discharge which later on influences on total suspended solid (TSS) in the estuarine water. The texture class of soil samples in the *H. beccarii* habitats was sandy clay, occasionally interrupted by silt. The sand component was 84-86%, followed by 12-13% clay and 1-2% silt. The sandy clay type of soil composition is usually found in the saline soils of Bangladesh (Rahman et al., 1993). Furthermore, the variation of soil texture in the estuarine coastal area could have been created during sedimentation process (Chou et al., 2004). The higher percentage of sand in soil texture in this study area suggests the deposition of sand particles from up stream river flow during monsoon.

### **Ecological and Economic Values**

The ecological and economic roles of this seagrass are useful in the development of marine ranching systems. Due to dense beds they form, covering large areas in shallow coastal waters, this grass performs various biological and physical functions in the marine environment. These functions include the stabilization of substrata, sediment production, provision of a habitat, nursery-ground and primary food source for fish, many other invertebrates, turtles and avifauna (birds). The seagrass ecosystems also serve as an alternative feeding site for forage species and seagrass itself acts as a nutrient source in the near-by ecosystems. This species has not been reported in the coastal area of Bangladesh except this report. No threat was observed during the present research due to lack of facilities such as funding and equipment. The biology and ecology of this species in the coastal area of Bangladesh is not well understood. However,

it is assumed that this species is in danger due to huge amount of siltation from the land and the sea level rise may change the zonation profile of these coastal macrophytes.

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