

## Notes on seagrasses along Myanmar Coastal Regions

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**Abstract:** A total of nine species belonging to five genera from two families of seagrasses was collected from the three coastal regions of Myanmar. These are *Cymodocea rotundata*, *C. serrulata*, *Halodule pinifolia*, *H. uninervis*, *Syringodium isoetifolium*, *Enhalus acoroides*, *Halophila beccarii*, *H. decipiens* and *H. ovalis*. Due to turbid water by enormous sediment discharge of two greatest rivers, the Ayeyarwady and the Thanlwin, the subtidal vegetation of seagrasses is totally absent in the Ayeyarwady Delta and the Gulf of Mottama (Martaban) Coastal Region. The family Hydrocharitaceae represents the most dominant genera of seagrasses in both the Rakhine and the Tanintharyi Coastal Regions. However, the family Cymodoceaceae occurs mainly in the Rakhine Coastal Region, except for *Cymodocea rotundata*, which is unique to the Tanintharyi Coastal Region. In addition, the phytogeographic distribution and conservation plans of seagrasses of Myanmar have been briefly described.

**Key words:** conservation plans, local distribution, morphology, Myanmar, seagrasses,

### Introduction

The Union of Myanmar, situated in the northern part of the Indian Ocean Region (IOR) with a coastline of 3060 km, continental shelf of about 230,000 km<sup>2</sup> and EEZ of about 470,000 km<sup>2</sup>, has the highly rich diversity of tropical marine flora, viz., mangroves, marine algae and seagrasses. Of these plants, seagrasses, the marine Angiosperms, grow exclusively in the subtidal zone so that most botanists in Myanmar commonly hesitate at the study of seagrasses due to difficulties in the collections of plants from underwater marine environments. However, some seagrasses, e.g., *Halophila ovalis* and *H. beccarii*, were collected from Myanmar waters of the Rakhine Coastal Region and deposited at British Museum (Natural History), London and Herbarium of the Royal Botanic Garden, Kew, Richmond in England by foreign explorers (Hartog 1970).

*Cymodocea serrulata*, *Halophila ovalis* and *Enhalus acoroides* have been reported from Kywethauk Gyaing and Maungshwelay Gyaing in the Andrew Bay (18°17'N, 94°20' E), the Rakhine Coastal Region (Min-Thein *et al.* 1979). Moreover, *Cymodocea rotundata*, *Halophila ovalis* and *Enhalus acoroides* have been collected from St. Luke Island (10°10'N, 98°15' E) of the Myeik (Mergui) Archipelago, the Tanintharyi Coastal Region (Soe-Htun *et al.* 1997). Normally, the local people call seagrasses as “Leik-Sar-Phat-Myet” in Myanmar, which means the foods of marine turtles such as the green (*Chelonia mydas*), the loggerhead (*Caretta caretta*), the hawksbill (*Eremochelys imbricata*) and the leatherhead (*Dermochelys coriacea*) found in Myanmar waters. Moreover, seagrass beds perform coastal stabilization, filters and exporting organic nutrients to the nearby ecosystems of coral reefs and mangroves and also provide the sheltered habitats as crucial feeding, spawning and nursery grounds for economically important species of marine invertebrates, coral reef fishes, and the sea cow, *Dugong dugon*. Further works on stock assessment along with an adaptive and pragmatic management policy for seagrasses are necessary with special emphasis on conservation of natural seagrass beds in Myanmar.

The purpose of the present study is to elucidate the existing conditions of species diversity and the local distribution of seagrasses growing along the three Coastal Regions of Myanmar.

### Materials and Methods

The seagrasses were collected in the forms of drifts or live materials growing in the natural beds by snorkeling from the various coastal areas of Myanmar (Fig.1) from 1976 to recent year, 2000. The collections were initially preserved in 10% formalin in seawater, examined mainly on the vegetative character's with the helps of dissecting microscope, and then pressed as herbarium specimens. All voucher specimens are deposited at the Herbarium of Department of Marine Science, Mawlamyine University (MMB), Mawlamyine, Myanmar. This study has followed the classification system used by M. D. Fortes (1993) and the identification of the seagrasses of Myanmar in part (except for *Syringodium isoetifolium* and *Cymodocea rotundata*) by Professor Charles F. Boudouresque, Laboratoire D'ecologie Du Benthos Et Biologie Vegetable Marine, Universite d'Aix-Marseille II, France in 1984.

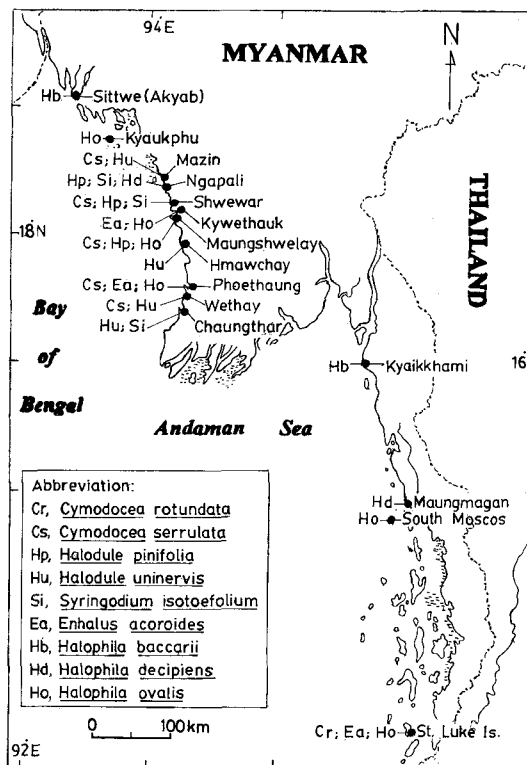


Fig.1. Map showing the collection sites of the seagrasses found in Myanmar

### Observations

Division Anthophyta  
 Class Monocotyledoneae  
 Order Helobiae  
 Family (1) Cymodoceaceae

#### 1. *Cymodocea rotundata* Ehrenberg et Hemprich ex Ascherson (Fig. 2)

C. den Hartog (1970): 166-171; H. Ogawa (1987): 44; H. Ogawa (1989): 59-60; M.D Fortes (1993) 137; K. Lewmanomont and H. Ogawa (1995): 142.

Erect plants moderate in size; the rhizome cylinder, internodes 0.8-2.2 cm long; erect shoots with 2-4 leaves, borne at the nodes; leaf blades linear, flat, 6-14 cm long, 1.5-5.0 mm wide, apex obtuse, leaf margin entire with 8-10 nerves, leaf sheath 1.3-1.7 cm long.

Local distribution of the specimens examined: (1) The Rakhine Coastal Region - Unknown.

(2) The Ayeyarwady Delta and the Gulf of Mottama (Martaban) Coastal Region - Unknown.

(3) The Tanintharyi Coastal Region - St. Luke Island (Soe-Htun and San-Tha-Tun, 21.xii.1997, MMB 3804-3805).

2. *Cymodocea serrulata* (R. Brown) Ascherson et Magnus (Fig. 3)

C. den Hartog (1970): 171-176; H. Ogawa (1987): 44; H. Ogawa (1989): 60; M.D Fortes (1993): 136; K. Lewmanomont and H. Ogawa (1995): 143.

Erect plants moderate in size; the rhizome 1mm in diameter, slightly larger than *C. rotundata*, internodes 2.2-3.3 cm long; shoots with 2-3 leaves at each node; leaf blade linear, flat, 4-13 cm long, 4.5-5.5 mm wide, apex serrulate, tapering at the base, leaf margin entire with 9-15 nerves, leaf sheaths 1.5-3.0 cm long.

Local distribution of specimens examined:

(1) The Rakhine Coastal Region - Mazin (Aung-Myint and Kyi-Shwe, 6.x.1976, MMB 131); (Aung-Myint and Kyi-Shwe, 9.x.1976, MMB 3780); Ngapali (Aung-Myint, 28.i.1977, MMB 1081, examined by C. F. Boudouresque, 1984; MMB 3781-3782); Shwewar Gyaing (Soe-Htun, drift, 29.iv.1984, MMB 3802); Maungshwelay Gyaing (Soe-Htun, 6.vi.1980, MMB 787, MMB 3793-3794, Soe-Htun, 27.i.1983, MMB 1160, examined by C. F. Boudouresque, 1984, MMB 3799); Phoehtaung Gyaing (Soe-Htun, 3.iv.1996, MMB 3914-3916); Wethay Gyaing (Soe-Htun, drift, 3.iv.1996, MMB 3920-3921).

(2) The Ayeyarwady Delta and the Gulf of Mottama (Martaban) Coastal Region - Unknown.

(3) The Tanintharyi Coastal Region - Unknown.

3. *Halodule pinifolia* (Miki) den Hartog (Fig. 4)

C. den Hartog (1970): 158-160; H. Ogawa (1987): 43; H. Ogawa (1989): 59; M. D. Fortes (1993): 136; K. Lewmanomont and H. Ogawa (1995): 145.

Plants small; the rhizome less than 1 mm, with internodes, 1.5-5.4 cm long; nodes bear erect shoots, each with 2-3 leaves; leaf blades flat,

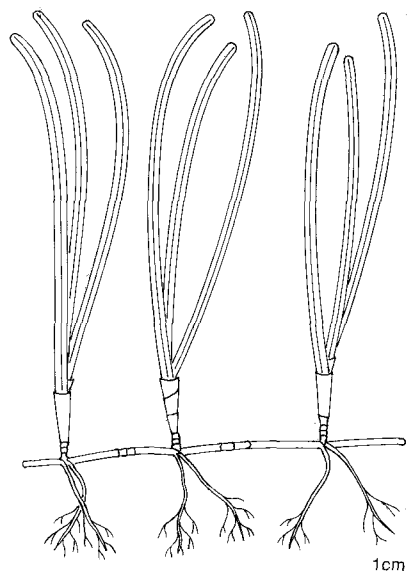


Fig. 2. Habitus of *Cymodocea rotundata* Ehrenberg et Hemprich ex Ascherson

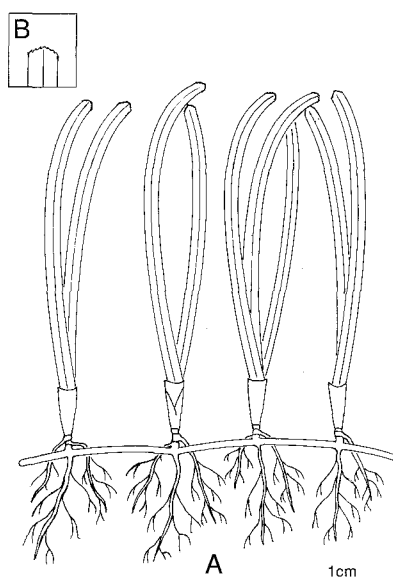


Fig. 3. Habitus of *Cymodocea serrulata* (R. Brown) Ascherson et Magnus (A, Habit of the plant; B, Details of the tip).

4-8 cm long, not more than 1 mm wide.

Local distribution of the specimens examined: (1) The Rakhine Coastal Region - Ngapali (Aung-Myint, 28.i.1977, MMB 1080, examined by C. F. Boudouresque, 1984 MMB 3785); Shwewar Gyaing (Soe-Htun, drift, 29.iv.1984, MMB 3081); Maungshwelay Gyaing (Soe-Htun, drift, 6.iv.1980, MMB 789, MMB 3785).

(2) The Ayeyarwady Delta and the Gulf of Mottama (Martaban) Coastal Region - Unknown.

(3) The Tanintharyi Coastal Region - Unknown.

#### 4. *Halodule uninervis* (Forsskal) Ascherson

(Fig. 5)

C. den Hartog (1970): 147-153; H. Ogawa (1987): 43; H. Ogawa (1989): M. D. Fortes (1993): 135; K. Lewmanomont and H. Ogawa (1995): 146.

Rhizome not exceeding than 1 mm thick; the internodes 1.8-3.5 cm long; erect shoot arising 2-3 flat, linear blades at each node; leaf blades flat, 13.0-22.5 cm long, 1-2 mm wide, margin entire, leaf sheath 1.5-3.0 cm long.

Local distribution of the specimens examined: (1) The Rakhine Coastal Region - Mazin (Aung-Myint and Kyi-Shwe, 9.x.1976, MMB 1067, examined by C. F. Boudouresque), Hmawchay Gyaing (Soe-Htun, drift, 15.iv.1980, MMB 790, MMB 3796); Wetthay Gyaing (Soe-Htun, 3.iv.1996, MMB 3922); Chaungthar (Soe-Htun, drift, 24.iv.2000, MMB 3904, Soe-Htun, drift, 24.iv.2000, MMB 3923).

(2) The Ayeyarwady Delta and the Gulf of Mottama (Martaban) Coastal Region - Unknown.

(3) The Tanintharyi Coastal Region - Unknown.

#### 5. *Syringodium isoetofolium* (Ascherson) Danty

(Fig. 6)

C. den Hartog (1970): 177-183; H. Ogawa (1987): 44-45; H. Ogawa (1989): 60-61; M. D. Fortes (1993): 134; K. Lewmanomont and H. Ogawa (1995): 152.

Plants erect; the rhizome 1 mm thick, with internodes, 1.4-2.5 cm long; each node giving a shoot with 1-3 leaves; leaves terete, tapering to the tip, 5.5-12.5 cm in length (or longer), 1 mm wide, base covered by leaf sheath, 1-3 cm long.

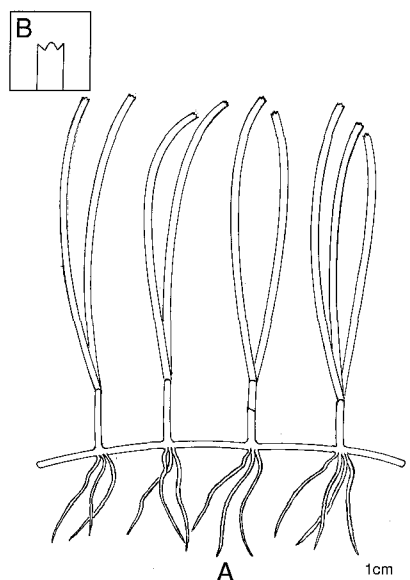


Fig. 4. Habitus of *Halodule pinifolia* (Miki) den Hartog (A, Habit of the plant; B, Details of the tip).

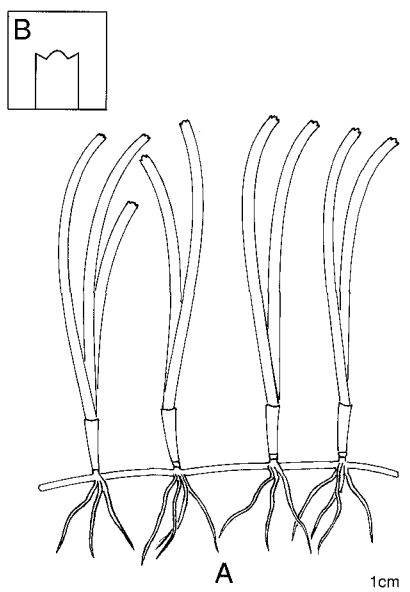


Fig. 5. Habitus of *Halodule uninervis* (Forsskal) Ascherson (A, Habit of the plant; B, Details of the tip).

Local distribution of the specimens examined: (1) The Rakhine Coastal Region - Ngapali (Aung-Myint, 28.i.1977, MMB 1092, MMB 3783-3784); Shwewar Gyaing (Soe-Htun, drift, 29.iv.1984, MMB 3803); Chaungthar (Soe-Htun, drift, 24.iv.2000, MMB 3905).

(2) The Ayeyarwady Delta and the Gulf of Mottama (Martaban) Coastal Region - Unknown.

(3) The Tanintharyi Coastal Region - Unknown.

#### Family (2) Hydrocharitaceae

##### 6. *Enhalus acoroides* (Linnaeus f.) Royle (Fig. 7)

C. den Hartog (1970): 215-222; H. Ogawa (1987): 45; H. Ogawa (1989): 61-62; M. D. Fortes (1993): 140; K. Lewmanomont and H. Ogawa (1995): 144.

Plant erect; the rhizome thick, about 1-2 cm in diameter with tough black fibers; shoots pronounced at the node, with 3-6 leaves; leaf blades flat and linear 73.0-100.5 cm long, 0.8-1.3 cm wide, with 35-55 nerves and ribs at the margin, apex obtuse, base narrow, margin slightly serrulate in young leaves.

Local distribution of the specimens examined: (1) The Rakhine Coastal Region - Kywethauk Gyaing (Aung-Myint, 10.iv.1977, MMB 531, examined by C. F. Boudouresque); Phoehtaung Gyaing (Soe-Htun, 4.iv.1996, MMB 3906-3910).

(2) The Ayeyarwady Delta and the Gulf of Mottama (Martaban) Coastal Region - Unknown.

(3) The Tanintharyi Coastal Region - St. Luke Island (Soe-Htun and San-Tha-Tun drift, 21.xii.1997, MMB 3901-3903).

##### 7. *Halophilla beccarii* Ascherson (Fig. 8)

C. den Hartog (1970): 261-263; M. D. Fortes (1993): 139; K. Lewmanomont and H. Ogawa (1995): 147.

Plants small; the rhizome less than 1mm in diameter with internodes 1.1-1.6 cm long; each node bears petiolated leaves; leaf lanceolate 5.5-7.5 mm long, 1.5-2.0 mm wide, apex acute, base attenuate, petiole 8-14 mm long, margin entire with 1-3 paralleled veins and no cross-veins.

Local distribution of the specimens examined: (1) The Rakhine Coastal Region -

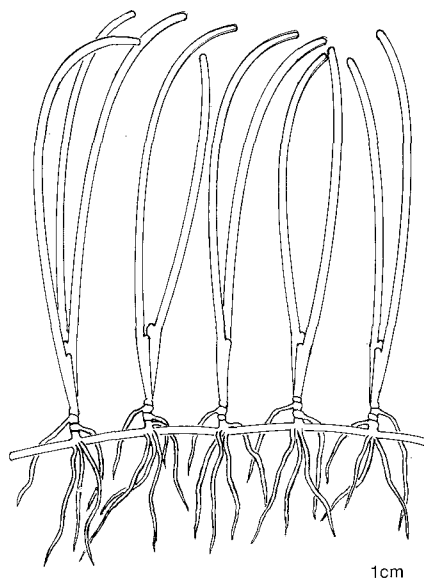


Fig.6. Habitus of *Syringodium isoetofolium* (Ascherson) Danty

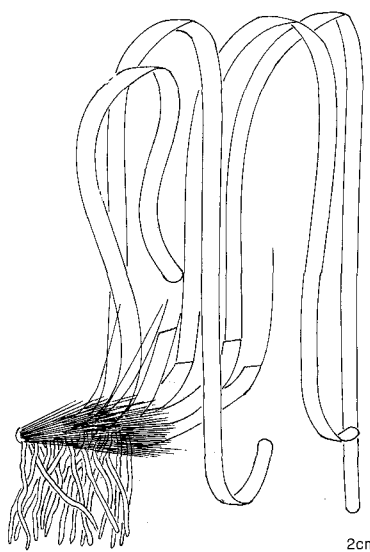


Fig.7. Habitus of *Enhalus acoroides* (Linnaeus f.) Royle

(Sittwe, Akyab, date unknown, S. Kurz, Herbarium No. Unknown examined by C. den Hartog in 1970 in the Herbarium of the Royal Botanic Gardens, Kew, Richmond, England).

(2) The Ayeyarwady Delta and the Gulf of Mottama (Martaban) Coastal Region -Unknown.

(3) The Tanintharyi Coastal Region -Kyaikkhami (Mu-Mu-Aye, 20.xi.1981, MMB 1161, examined by C. F. Boudouresque, MMB 3797-3798).

8. *Halophila decipiens* Ostenfeld (Fig. 9)

C. den Hartog (1970): 254-258; M. D. Fortes (1993): 137; K. Lewmanomont and H. Ogawa (1995): 148.

Plants small; the rhizomes less than 1 mm in diameter; internodes 1.2-2.7 cm long, a pair of leaves borne on a petiole; leaf oblong, 1.0-1.7 cm long, 3-6 mm wide, margin finely serrated, midrib conspicuous, cross-veins persistent, petiole 1.0-1.7 cm long, apex obtuse, base enclosed by a pair of transparent scale.

Local distribution of specimens examined:

(1) The Rakhine Coastal Region - Ngapali (Aung-Myint, 28.i.1977, MMB 921).

(2) The Ayeyarwady Delta and the Gulf of Mottama (Martaban) Coastal Region -Unknown.

(3) The Tanintharyi Coastal Region - Maungmagan (Ky-Win, 14.v.1977, MMB 524, examined by C. F. Boudouresque, MMB 3789-3792).

9. *Halophila ovalis* (R. Brown) Hooker f. (Fig. 10)

C. den Hartog (1970): 240-254; H. Ogawa (1987): 46; H. Ogawa (1989): 63; M. D. Fortes (1993): 138; K. Lewmanomont and H. Ogawa (1995): 150.

Plants small; the rhizome less than 1mm in diameter, slightly larger than *H. decipiens*, internodes 1.8-2.4 cm long; erect shoot at each node, bearing a pair of petiolated leaves; leaf obovate or elliptic, 1.5-2.2 cm long, 7-10 mm wide, margin entire, apex obtuse, base rounded, petiole 2.2-3.0 cm long, midrib prominent with 12-17 cross-veins.

Local distribution of the specimens examined: (1) The Rakhine Coastal Region - Kyaukphyu, Ramree Island, floating in the sea (E. C. Wallace, 11.v.1945, 128, examined by C. den

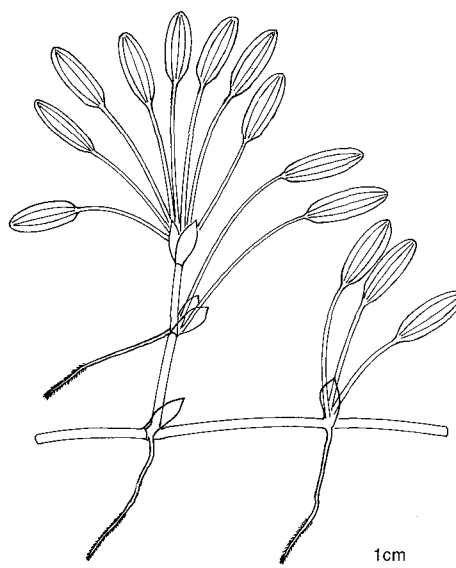


Fig.8. Habitus of *Halophilla beccarii* Ascherson

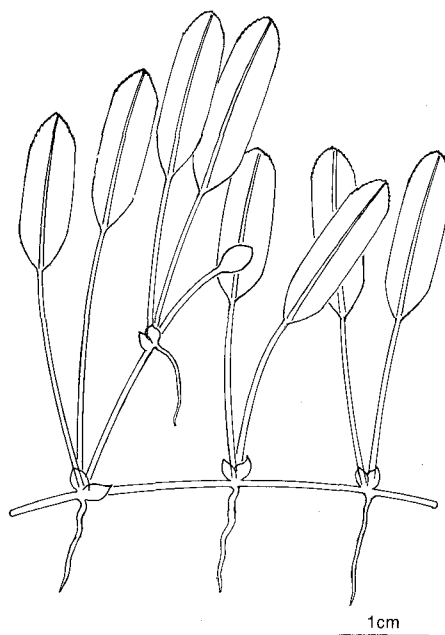


Fig.9. Habitus of *Halophila decipiens* Ostenfeld

Hartog in 1970, in the British Museum (National History), London and the Herbarium of the Royal Botanic Gardens, Kew, Richmond, England); Kywethauk Gyaing (Aung-Myint, 4.v.1977, MMB 521, examined by C. F. Boudouresque, MMB 3786-3789); Maungshwelay Gyaing (Soe-Htun, drift, 6.iv.1980, MMB 788); Phoehtaung Gyaing (Soe-Htun, 3.iv.1996, MMB 3917-3919).

(2) The Ayeyarwady Delta and the Gulf of Mottama (Martaban) Coastal Region -Unknown.

(3) The Tanintharyi Coastal Region - South Moscos Island (Soe-Htun and Ni-Ni-Win 2.iv.2000, MMB 3911-3913); St. Luke Island (Soe-Htun and San-Tha-Tun, 21.xii.1997, MMB 3802, MMB 3806-3808).

### Discussion

Table 1 summarizes the distribution of seagrasses along Myanmar Coastal Regions.

There are no records on seagrasses growing

along the Ayeyarwady Delta and Gulf of Mottama (Martaban) Coastal Regions due perhaps to 3 factors: (1) the high turbidity of water which decreases light penetration that in turn causes the absence of seagrasses; (2) hyposalinity (ca. 5-10‰) of the brackish water which also prohibits the luxuriant growth of seagrasses; and (3) the predominance of mud- or silt-covered shallow flats which migrate seawards at a rate of about 50 m per year. Although the annual sediment discharge of the Ayeyarwady has been estimated at 250 million tons (San-Myint 1995), no attempt has yet been made to establish a direct correlation between these three factors and the growth of seagrasses. The total of eight species of seagrasses, namely, *Cymodocea serrulata*, *Halodule pinifolia*, *H. uninervis*, *Syringodium isoetofolium*, *Enhalus acoroides*, *Halophila beccarii*, *H. decipiens* and *H. ovalis* occur in the Rakhine Coastal Region whereas those of five species, namely, *Cymodocea rotundata*, *Enhalus acoroides*, *Halophila beccarii*, *H. decipiens* and *H. ovalis* represent the Tanintharyi Coastal Region.

In comparison, *Cymodocea serrulata*, *Halodule pinifolia*, *H. uninervis* and *Syringodium isoetofolium* can be found only in the Rakhine Coastal Region, but not in the Tanintharyi Coastal Region, showing seemingly limited distribution of these plants in the inner areas of the Andaman Sea of Myanmar. Likewise, *C. rotundata* distributes only in the Tanintharyi Coastal Region but no information is available for this plant in Rakhine Coastal Region. However, *Enhalus acoroides* and *Halophila beccarii* are very common in both coastal regions. So far, there are nine species of seagrasses such as *Cymodocea rotundata*, *C. serrulata*, *Halodule pinifolia*, *H. uninervis*, *Syringodium isoetofolium*, *Enhalus acoroides*, *Halophila beccarii*, *H. decipiens* and *H. ovalis* growing along Myanmar Coastal Regions.

Furthermore, a rich biodiversity of marine life such as sea anemones, sponges, cnidarians, marine annelids, gastropods, cephalopods, edible oysters and clams, *Scylla* sp., *Penaeus* spp., lophophorates, echinoderms, sea slugs, *Holothuria* spp., sea urchins, butterfly fishes, angel fishes, damsel, wrasses and fairy basslets, rabbit fishes, surgeon fishes and trigger fishes, puffer and hawk fishes, sea horses, pipe fishes, *Mugil* spp., *Hilsa* spp., *Lates* spp., and many kinds of marine



**Fig.10.** Habitus of *Halophila ovalis* (R. Brown) Hooker f.

**Table 1.** The distribution of seagrasses along Myanmar Coastal Regions

Seagrass ( Family / Genus / Species )	Rakhine Coastal Region										Ayeyawady Delta and Gulf of Mottama (Martaban) Coastal Region	Tanintharyi Coastal Region			
	Sittwe	Kyaukphyu	Mazin	Ngapali	Shwewar Gyaing	Kywethauk Gyaing	Maungshwelay Gyaing	Hmawchay Gyaing	Phoethaung Gyaing	Wethay Gyaing	Changthar	Kyaikkhami	Maungmagan	South Moscos Islands	St. Luke Island
Cymodoceaceae															
<i>Cymodocea rotundata</i>	-	-	-	-	-	-	-	-	-	-	-	-	-	-	+
<i>C. serrulata</i>	-	-	+	-	+	-	+	-	+	+	-	-	-	-	-
<i>Halodule pinifolia</i>	-	-	-	+	+	-	+	-	-	-	-	-	-	-	-
<i>H. uninervis</i>	-	-	+	-	-	-	-	+	-	+	+	-	-	-	-
<i>Syringodium isoetifolium</i>	-	-	-	+	+	-	-	-	-	-	+	-	-	-	-
Hydrocharitaceae															
<i>Enhalus acoroides</i>	-	-	-	-	-	+	-	-	+	-	-	-	-	-	+
<i>Halophila beccarii</i>	x	-	-	-	-	-	-	-	-	-	-	+	-	-	-
<i>H. decipiens</i>	-	-	-	+	-	-	-	-	-	-	-	-	+	-	-
<i>H. ovalis</i>	-	x	-	-	-	+	+	-	+	-	-	-	-	+	+
Total	1	1	2	3	3	2	3	1	3	2	2	-	1	1	3

Symbols: +, Presence; -, Absence (no information available); x, Presence according to C. den Hartog (1970).

algae, such as *Caulerpa* spp., *Codium* spp., *Padina* spp., *Dictyota* spp., *Hormophysa triquetra*, *Turbinaria ornata*, *Sargassum* spp., *Gracilaria* spp., *Hypnea* spp. and *Spyridia filamentosa*, can be observed in the meadows of seagrass of Myanmar. In addition, these seagrass beds serve as the feeding grounds for the endangered and vulnerable species of marine turtles, namely, the green (*Chelonia mydas*), the loggerhead (*Caretta caretta*), the hawksbill (*Eremochelys imbricata*) and the leathered (*Dermochelys coriacea*), and the sea cow, *Dugong dugon*, commonly known as "Yay-Wet" in Myanmar, (i.e., the pig of the sea) among the local fishermen.

Presently, there are no stresses in the meadows of seagrasses indigenous to coastal areas of Myanmar, showing in pristine and climax conditions. By contrast, seagrass beds served as major feeding, spawning and breeding grounds for marine invertebrates and vertebrates are being disturbed by man-made activities such as aquaculture ponds for fish, crabs and prawns, solar salt production farms, industrialization, urban development, ports, mining, waste disposal and recreation areas in the ASEAN countries, viz., Indonesia, Malaysia, the Philippines, Singapore and Thailand (Fortes 1990; Kenchington *et al.* 1996; Swe-Thwin 1998).

During the last two decades, Myanmar also advances rapidly all infrastructures in building the



nation into a modern and developed one, as in other ASEAN countries. Due to the absence of skilled marine ecologists and adequately trained environmentalists, sophisticated and modernized instruments along with methodologies for the measurements of parameters of the ocean in Myanmar, the conservation of the marine environments stays one step behind the fruitfulness of the nation-wide constructive works that might threaten the marine life of the Bay of Bengal and the Andaman Sea in some days, as in case studies of many ecosystems of seagrass damaged by indirectly related land-based sources along the coasts of the ASEAN and other developed countries. For example, the production of natural gas and mineral deposits in watershed and offshore areas of the Tanintharyi Coastal Region will be considered as significant impact on the marine living resources of the Andaman Sea in the future because of the lack of well planned managements to the coastal and marine zones at the present time (Htun-Paw-Oo 1998). Fortunately, it is hoped that a twice-yearly reversal of monsoon winds and surface currents normally reduces the impact of pollution on the marine life of Myanmar by dilution and dispersion as in the IOR (IUCN/UNEP 1985; UNEP 1985; Sen Gupta *et al.* 1990).

Hence, the protected areas of seagrass beds should be assigned for the dominant beds of *Cymodocea serrulata* in the Rakhine and *Cymodocea rotundata* in Tanintharyi Coastal Region for the conservational and biodiversity researches. Similarly, the national contingency plans should be prepared for the areas of natural perturbations (e.g., seagrasses beds damaged by many landslides due to unexpected torrential rain along the Tanintharyi Coastal Region in 1997). Moreover, the regional and international cooperation in research and development on biology (i.e., inter-specific association of epifauna and epiflora, micro- and macro-benthos etc.), ecology (i.e., measurement of physico-chemical parameters, pH, salinity, temperature, dissolved oxygen and conductivity, visibility, mapping using satellite images and ground truth survey, seasonal measurement of biomass and productivity of seagrass beds), and conservation works (i.e., detailed assessments and management of seagrasses, transplanting methods for coastal rehabilitation, and seagrasses used as pollution indicator) are still needed to protect the natural seagrass beds of Myanmar.

It is expected that the integrated coastal zone management (ICZM) programs based on sectional activities of various organizations concerned, with the co-ordination of international assistance for three Coastal Regions of Myanmar will be effective for the sustainability of natural resources of seagrasses in Myanmar in coming years. Nevertheless, it must be noted that earlier conservation for the resources of pristine seagrasses of Myanmar will directly and indirectly ensure benefits for the rich biodiversity, including marine turtles, small cetaceans and dugongs, of the Indian Ocean Region (IOR) sooner.

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