

NEW RECORDS OF SEAWEEDS FROM THE ST. MARTIN'S REEF, BANGLADESH. II.

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Keywords: New records; St. Martin's Reef; Cox's Bazar; Bangladesh.

Abstract

Peyssonnelia conchicola Piccone and Grunow, *Gymnothamnion elegans* (Schousboe) J. Ag. (reds) and *Spatoglossum schroederi* (Mertens) Kütz. (brown) seaweeds as new records are described and reported here in the second part of studies in the St. Martin's Reef. This along with the eight seaweeds (with six new records) recorded and described in the first part earlier, the total taxa now are 11 (eleven). Again, all the eight samples were collected in a single day light period. Through extensive studies including sub-littoral zones of the two tiny Reefs having crystal clear water is expected to yield many seaweed species, including new ones.

Introduction

Occurrence of the St. Martin's Reef (SMR) (Fig. 1; Aziz *et al.* 2015, 2023) at about 14 km west of the St. Martin's Island was known only in the year 2013, and first explored its sub-littoral seaweed flora on 24th April 2014 with the assistance of Bangladesh Navy reporting 8 seaweeds such as (*Pterocladia maribagoensis* Boo et Geraldino, *Hypnea spinella* (C. Agardh) Kützting, *Jania pumila* Lamx., *J. unguolata* f. *brevior* (Yendo) Dawson, *Bryopsis plumosa* (Huds.) C. Ag. and *Halimeda tuna* (Lin.) Lamx).of which *Pterocladia maribagoensis* Boo et Geraldino, and *Bryopsis plumosa* (Huds.) C. Ag. were indicator species of a new Reef and six taxa having low Turbidity (0.23 NTU), >5.5 m Secchi depth (visibility) and 22% light penetration up to 1 m depth indicate a highly transparent water (Aziz *et al.*, 2023).

Materials and Methods

Studies were carried out on the seaweed specimens collected from St. Martin's Reef on 24 April 2014, taking a complete support from the Bangladesh Navy and its Scuba diving team equipped with underwater Communication systems. The SMR is situated at 20° 33' 24" - 20° 34' 48" N and 92° 10' 24" - 92° 11' 12" E, about 14 km west of the SMI (Aziz *et al.* 2015, 2023; Aziz and Alfasane, 2020).

Collected seaweed samples were taken in transparent polythene bags filled with seawater, kept in icebox, transferred to laboratory, preserved in 10% formalin and herbaria were prepared. All the preserved specimens and herbarium sheets are kept in the National Professor AKM Nurul Islam Laboratory, Department of Botany, University of Dhaka.

Results and Discussion

Occurrence and illustrated account of three seaweeds in the St. Martin's Reef, are presented in the present paper. An illustrated account of the two groups of seaweed taxa recorded from the St. Martin's Reef along with discussion against each taxon is given.

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Fig. 2A-C. *Peyssonnelia conchicola* Piccone and Grunow. (A) A preserved whole plant. (B) Vertical section showing distromatic thallus and rhizoids from hypothallial cell (cc= Calcium Carbonate, r = rhizoid). (C) A portion enlarged showing rhizoid formation. Scale= 10 μ m.

The species differs from *P. polymorpha* (Aziz, 1997, P. 81-83, Figs1-4) by having rectangular cells in two layers, the hypothallus and non-calcified whole frond like *P. rubra* (Fritsch, 1945).

Collection no. 2A (14)

Order: Ceramiales; Family: Ceramiaceae

Genus: Gymnothamnion J. Agardh

2. Gymnothamnion elegans (Schousboe) J. Agardh. (Fig. 3A-C)

(Taylor, 1960, P. 522, Pl.66, Figs. 1-4; Joly and Cordeiro, 1962, P. 225, Pl. 2, Figs. 1-2; Pham, 1969, P. 221, Fig. 2.151)

Synonyms: *Gymnothamnion bipinnatum* Collins et Hervey; *Callithamnion elegans* (Schousb.) Born. et Thuret; *Plumaria ramosa* Yam. et Tan.; *Ptilothamnion bipinnatum* Howe

Plants filamentous, monosiphonous, uncorticated, the primary filaments decumbent and attaching by rhizoids, forming on the upper side plumose fronds which have a percurrent axis and opposite pinnate or bipinnate branching, plants up to 1-4 cm long, or intertwined to form a thin mat over the substratum, generally showing rhizomatous axes bearing erect pinnate branches 0.7-5.1 mm. tall, with descending rhizoids opposite these; the axes 20-25 μ diam., the cells 2-5 μ diameters long, subcylindrical or somewhat clavate, bearing the branchlets at the forward end; branchlets opposite in pairs, 9-14 μ diam., sometimes reduced or absent; on well developed or erect branches regularly distichously pinnate and plumose, the pinnae somewhat ascending, often regularly again pinnate on the upper side only. Thallus articulated consisting of a horizontal rhizome, a single row of elongated cells, and erect axes (pinna) produced from a relatively short robust cell of the rhizome after every 2-6 cells and opposite to it, rhizoids developed at the tip of three to five-celled branch (Fig. 3A-C). Axes generally pinnately branched (pinnules), shorter at the base and top, densely equidistantly placed, median pinnules up to 1 mm long consisting of up to nine cylindrical cells. Terminal part of each axis is pyramidate consisting of about seven pairs of pinnae. Balloon-like conceptacles are located at tips of median pinnules, sporangia tetrahedral, spherical, or somewhat ovoid (Fig. 3C).

Habitat: Grows on rocky substrata as creeper.

Collection no. 1A (11)

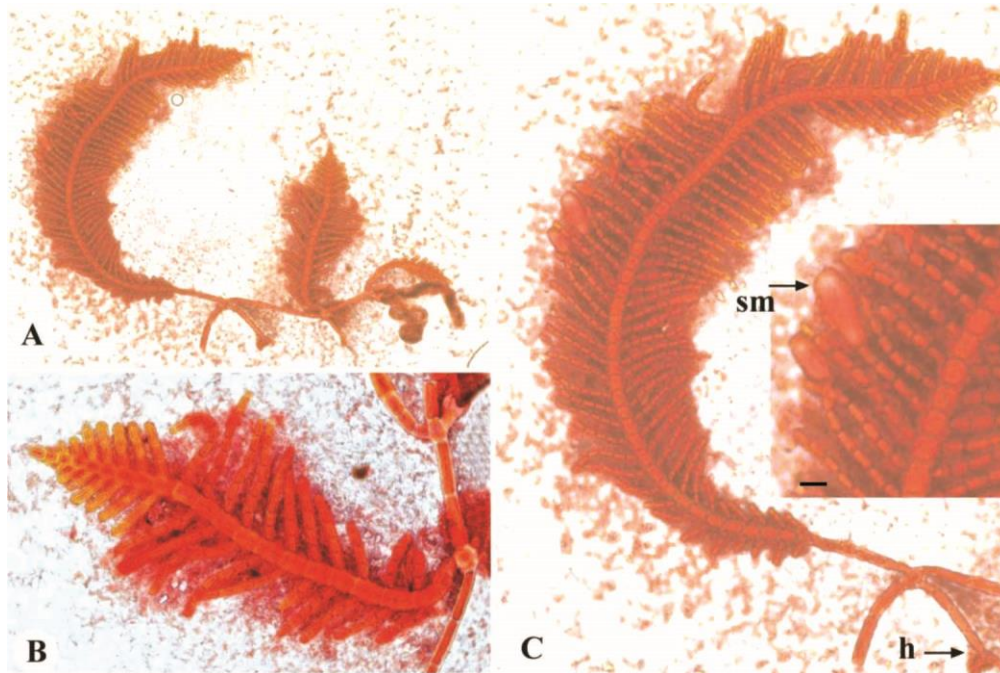


Fig. 3A-C. *Gymnothamnion elegans* (Schousboe) J. Agardh. (stained with safranin). (A) A part of plant showing rhizomatous prostrate part with rhizoids (h) from the under surface and 3 pinnate branches (pinnae) from above. (B) A developing photosynthetic/ erect axis consisting of 21 axial cells or 21 pair branches. (C) Showing enlarged pinnules with balloon-like sporangia at the tip. Bars = 5 mm. (sm = sporangium, h = hapteron). Scale= 10 μ m.

PHAEOPHYCEAE

Order: Dictyotales; Family: Dictyotaceae

Genus: *Spatoglossum* Kützing

3. *Spatoglossum schroederi* (Mertens) Kützing

(Fig. 4A-C)

(Taylor, 1960, P. 225, Pl. 33, Fig. 5)

Thallus dark brown in colour, turned to black-brown when dried, moderately adherent to paper, flattened and erect, 5-12 cm in height, branches irregularly dichotomous or sub-dichotomous, deeply and repeatedly alternately or palmately lobed, the apices rounded, terminal segments often elongated in the older parts, the margin with or without conspicuous teeth and proliferous lobes, the margins undulate or irregularly dentate, the teeth in part acute ; possesses a matted rhizoidal holdfast (Fig. 4); lamina is about 0.6 mm thick, cuticle is 4.5- 5.0 μ m thick; epidermal cells short but about 20.5 μ m in diameter; cortical cells uniformly thick from epidermis to medullary zone, approximately similar in size, thickness more or less ranging from 25.5 to 38.0 μ m, periclinally 44.0 – 59.0 μ m, medulla cells thickness ranges from 44.0 – 66.0 μ m, periclinally 80- 94 μ m (Figs. 4B-C);; high concentration of plastid in epidermal cells, fewer in cortical and medullary cells; plastids are very small, spherical, 1.0-2.0 μ m in diameter; in surface view, cells are rectangular to quadrangular, number of cells in tiers varied little, 6- 8 in stacks beside two layered medullary region (Fig. 4C); reproductive structure not found.

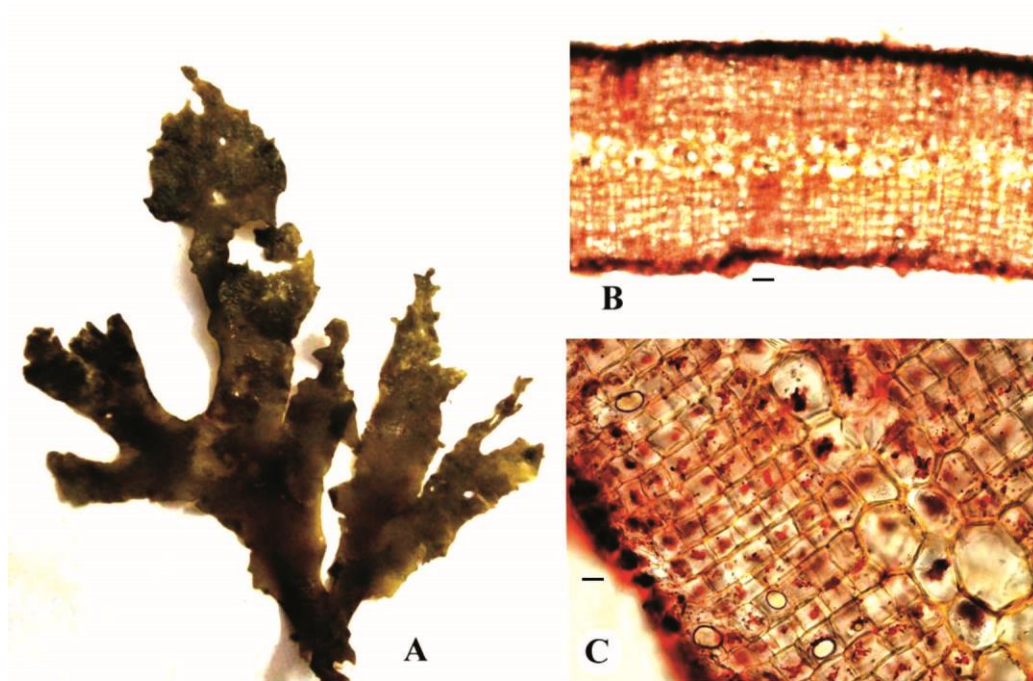


Fig. 4A-C. *Spatoglossum schroederi* (Mertens) Kützing; (A) A whole plant. (B) Transverse section of the frond showing two layered thick walled medullary cells with brick-like stacked cortical layers of cells. (C) Enlarged part of transverse section. Scale= 10 μ m.

Islam *et al.* (2004) reported *Spatoglossum asperum* from St. Martin's Island, Bangladesh. The present species is much smaller and sometimes with proliferations. Medullary region of *S. asperum* shows a single layer of quadratic cells with poor contents. But in this species medullary region shows two layers of cells (Fig. 4C) and more regularly arranged cortical layers than that of *S. asperum*.

Habitat: *Spatoglossum schroederi* grows on boulders, tightly attached with the substratum by matted rhizoidal holdfast.

Collection no. 2A (16)

The only six collections were made from only about 5-20% of the Reefs area in day light and recorded a total of 11 taxa and should be considered as the starting point. A thorough study around the reefs including sub-littoral zones (10- 20 m depth) expected to yield a good number of genera and species of all three groups. The assumption is based on the physical and chemical parameters of the reef studied: (i) high Secchi depth (>5.5 m), (ii) high transparency thus light penetration of 22% at 1m depth), (iii) low turbidity (0.23 NTU) and (iv) importantly the rocky Bay bottom (Aziz *et al.* 2023) could be a best site for Seaweed cultivation around the Reefs.

Acknowledgements

Heartfelt gratitude to the Bangladesh Navy authority for providing the Naval Ship and Scuba Divers with Underwater Photographic and Communication Systems to carry out the research in the bottom of the Sea Reef.

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(Manuscript received on 10 March 2022; revised on 12 October 2023)