

**MARINE ALGAE OF ST. MARTIN'S ISLAND, BANGLADESH. VII.  
ACROCHAETIUM NURULISLAMII SP. NOV. AND NEW RECORDS  
OF ACROCHAETIUM (RHODOPHYCEAE)**

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*Key words: Acrochaetium nurulislamii sp. nov., Acrochaetium spp., Red algae, Bangladesh*

**Abstract**

*Acrochaetium nurulislamii sp. nov.* and *Acrochaetium polysporum* Howe, *A. sagraeanum* (Montagne) Borneo and *A. zosteriae* Papenfuss are recorded and described for the first time from the St. Martin's Island, Cox's Bazar, Bangladesh.

**Introduction**

The genus *Acrochaetium* in the St. Martin's Island, Cox's Bazar district Bangladesh is represented by *A. crassipes* Børgesen (Islam 1976) and *A. bengalicum* Islam et Aziz 1987, both were found to be growing on *Liagora* sp. The authors received some marine macro-algae from Dr. Abdullah Harun Chowdhury, Khulna University collected in 2006 from the Island. The authors on examination came across some forms of *Acrochaetium*, one of which is new to science and three other species were not recorded earlier from the Bangladesh territory. These species are described and illustrated in the present account.

**Materials and Methods**

Several marine algae were collected from the littoral (exposed and knee-deep water below low tide mark) zone of the St. Martin's Island, Cox's Bazar district Bangladesh on 6 January, 2006 by Dr. Abdullah Harun Chowdhury, University of Khulna. The algal materials were preserved with 4% formalin in marine water. Out of these, collection no. 212 was found to contain *Hypnea boergesenii* Tanaka and *Struvea anastomosans* (Harv.) Picc., which were growing on rocks on the northwest coast of the island. Microscopic algae growing on these marine algae were studied.

**Results and Discussion**

*Acrochaetium nurulislamii sp. nov.*, *A. polysporum* Howe, *A. sagraeanum* (Montagne) Borneo and *A. zosteriae* Papenfuss were found to be growing on some macro-algae collected from the coast of St. Martin's Island, Bangladesh. A key to these species and their descriptions and illustrations are given below.

**Key to the species of *Acrochaetium* Nägeli**

- |  |                        |
|--|------------------------|
| 1. Sporangia sessile or one celled stalk   | 2                      |
| 1. Sporangia sessile, unilateral in long second series on the inner side of branches | <i>A. nurulislamii</i> |
| 2. Sporangia monosporous   | 3                      |
| 2. Sporangia polysporous, where spores regenerate after release of the previous one  | <i>A. polysporum</i>   |
| 3. Monosporangia ovoid with apiculum   | <i>A. sagraeanum</i>   |
| 3. Monosporangia cylindric-obovoid, without apiculum                                 | <i>A. zosteriae</i>    |

There are 343 species names in the species database of the genus at present where 194 are currently accepted.

The genus *Acrochaetium* Nägeli is distributed worldwide, almost exclusively marine, most diversified in temperate areas, especially the North Atlantic. Plants are often epiphytic on other marine algae or angiosperms, sometimes epizoic, semi-endophytic or semi-endozoic.

**Class: Rhodophyceae; Order: Acrochaetiales; Family: Acrochaetiaceae**

**Genus: *Acrochaetium* Nägeli**

1. ***Acrochaetium nurulislamii* A. Aziz et S. Islam (Fig. 1 A-E)**

*Etymology:* Greek *nurulislamii* = after National Professor late Dr. A.K.M. Nurul Islam who was the pioneer of algal researches in Bangladesh.

*Thallus 1.5-3.5 mm altus, simplex, unilateralis ad aliquando cum alternaribus ramorum; cellulae 12.70-24.00 µm longa, 6.68-7.30 µm latus; basalis parte unistrato disco basali ex cellulae aggregatus, aliqua fila repentia qui fortasse evolutus in fila erectus; chromatophores singulus, complanatus cum duo pyrenoides, unus ad quoque extremis; monosporangia sessiles, oodes, unilateral in longum secund series praecipue in interior latus ex ramorum, 13.00-13.30 µm longa, 8.20-9.00 µm latus; sexuales systema non visi.*

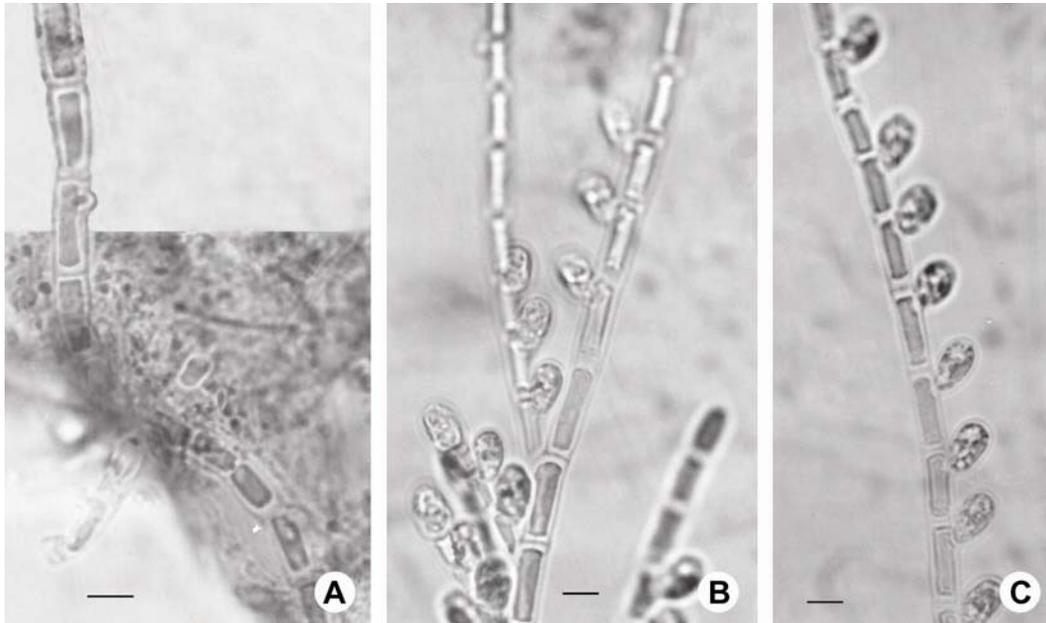


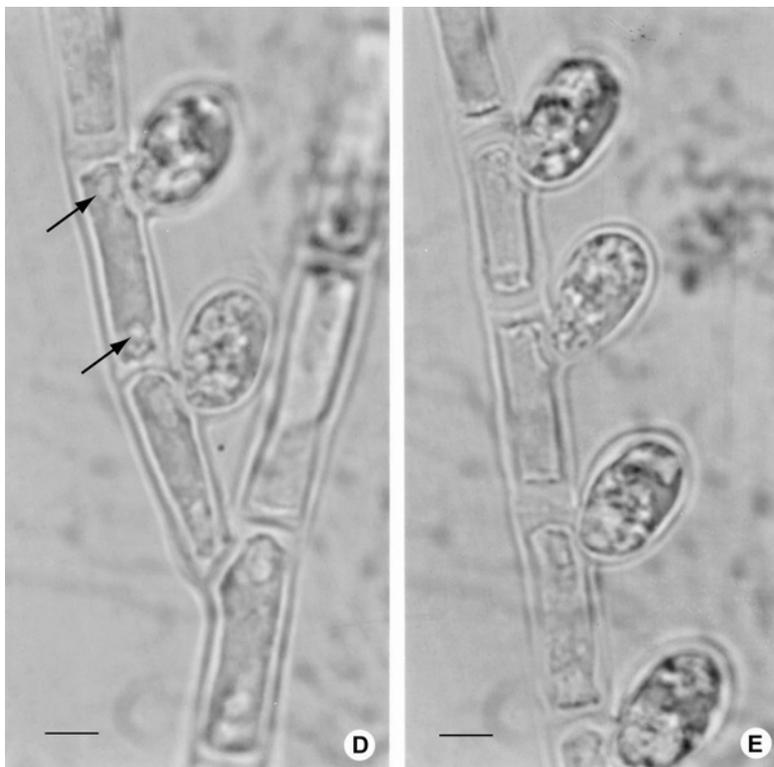
Fig. 1 A-E. *Acrochaetium nurulislamii* sp. nov. A. Basal portion of a plant showing attachment with *Polysiphonia*; B. A portion of the plant showing pattern of branching with monosporangia; C. A portion of a branch showing sessile monosporangia in a long second series. Scales = 10 µm.

*Habit:* Thalli simple, uniseriate, branched, 1.5 to 3.5 mm tall.

*Vegetative structures:* Basal portion of the thallus consisting of a one layered basal disc of crowded cells and some produced into filaments which creep for some distance, in some thalli these are produced into erect filaments; from the disc a single and simple erect filament arises which are sparsely branched as unilateral to sometimes alternate; cells elongate, basal cell

elongate-conical (12.70  $\mu\text{m}$  long) whose broader end is about 6.86  $\mu\text{m}$ , median cells about 16.0 long and 7.00-7.30  $\mu\text{m}$  broad, cells of the distal region about 24.00  $\mu\text{m}$  long and 7.30  $\mu\text{m}$  broad; chromatophores single, plate-like, with two lobed pyrenoids, one at each end.

*Reproductive structures:* Monosporangia sessile unilateral in long second series on the inner side of branches starting from their first cells and also at the tip of short branches, produced in lower part of the thallus; oval but slightly narrowed proximally (egg-shaped), 13.00 to 13.30  $\mu\text{m}$  long, 8.20 to 9.00  $\mu\text{m}$  broad; sexual stage not observed.



(Contd.)

Fig. 1 D-E. *Acrochaetium nurulislamii* sp. nov. Oval sessile monosporangia and vegetative cells with plate like chromatophores possessing pyrenoids at both ends of each cell (arrows in D). Scales = 5  $\mu\text{m}$ .

Presence of monosporangia in a long second series on the upper part of branches in the present material resembles *A. seriatum* Børgesen but the present thallus is not tufted; chromatophores are with two pyrenoids situated one at each end; filaments with long cells and sessile monosporangia, and hence it is considered as a new species.

*Habitat:* Marine, epiphytic on *Polysiphonia* (epiphytic on *Hypnea boergesenii*), *Hypnea boergesenii*, along with *Goniotrichum alsidii*; collection no. 212, littoral zone; common. Abdullah Harun Chowdhury, January 06, 2006 (DHAKA TYPE).

*Holotype:* Collection no. 212, photomicrographs, Fig. 1 (A-E); January 06, 2006; leg. Abdullah Harun; kept in the author's herbarium, Department of Botany, University of Dhaka.

Type locality: North west coast of the St. Martin's Island, Bangladesh.

2. **Acrochaetium polysporum** Howe

(Fig. 2 A-D)

(Dawson *et al.* 1964, 36, Pl. 29, Figs E-F)

*Synonym:* *Chantransia polyspora* De Toni

*Habit:* Plants epiphytic, branched, about 2.50 mm high.

*Vegetative structures:* Plants consist of a tuft of erect, branched filaments developed from a superficial stratum of radiating filaments on the surface of the host; the cells cylindric or slightly tumid (Fig. 2A), 15.24-25.40  $\mu\text{m}$  long and 3.81-6.35  $\mu\text{m}$  broad, chromatophore single, plate-like, with a pyrenoid.

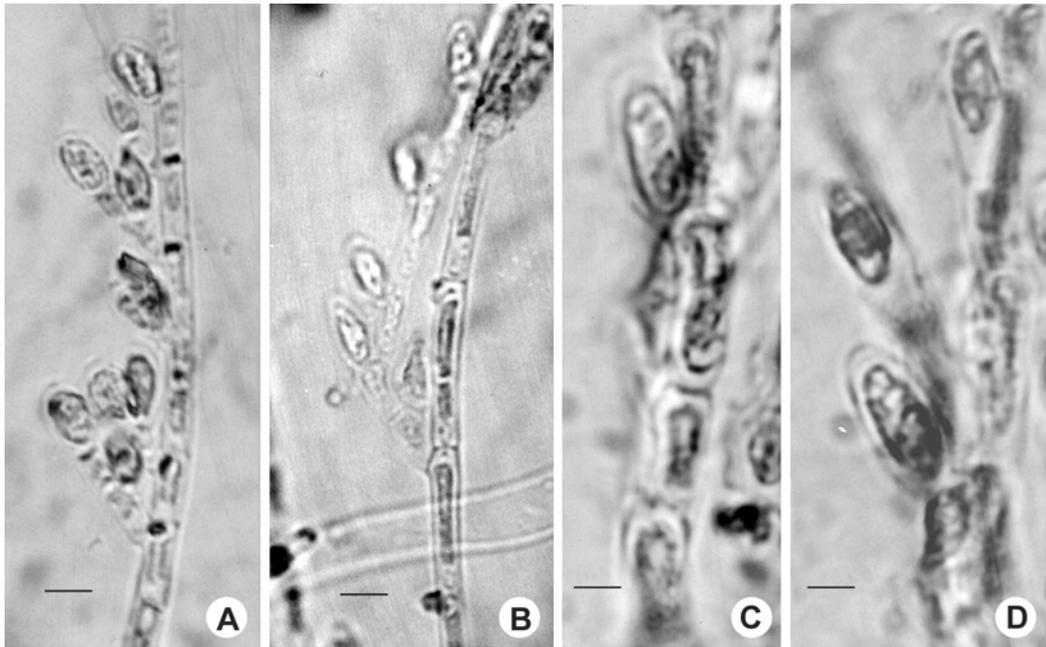


Fig. 2 A-D. *Acrochaetium polysporum* Howe. A-B. Portions of plants showing monosporangia on branches; C-D. Portions of plants enlarged showing the vegetative cell and spore content. Scales: A-B = 10  $\mu\text{m}$ , C-D = 5  $\mu\text{m}$ .

*Reproductive structures:* Monosporangia ovoid to broadly elliptical, 10.00-12.70  $\mu\text{m}$  long and 5.00-12.70  $\mu\text{m}$  broad, polysporous, containing usually 8-16 spores, lateral or terminal, mostly in a secund lateral series of 3-15, very rarely opposite, sessile or with 1-celled stalk, nearly every cell of the erect filament develop a sporangium, commonly terminal on short and less commonly on longer filaments; sporangia more or less unilaterally gibbous or protuberant (Fig. B, C).

*Habitat and local distribution:* Epiphytic on *Struvea anastomosans* (Harv.) Picc.; St. Martin's Island, Cox's Bazar, collection no. 212; common.

*Geographical distribution:* South America: Chile, Peru; Asia: Japan.

3. **Acrochaetium sagraeanum** (Montagne) Bornet  
(Aziz 1965, 66, Pl. 30, Figs 1-2)

(Fig. 3 A-C)

*Synonym:* *Cladophora sagraeana* Montagne; *Chantransia sagraeana* De Toni

*Habit:* Plants epiphytic, branched, about 2 mm tall.

*Vegetative structures:* Plants consist of erect, branched filaments from the surface of the host, cells of the main filaments 15.24-17.78  $\mu\text{m}$  long and 5.08-6.35  $\mu\text{m}$  broad, filaments gradually tapering toward the apex (Fig. 3B), chromatophores single, plate-like, with one pyrenoid.

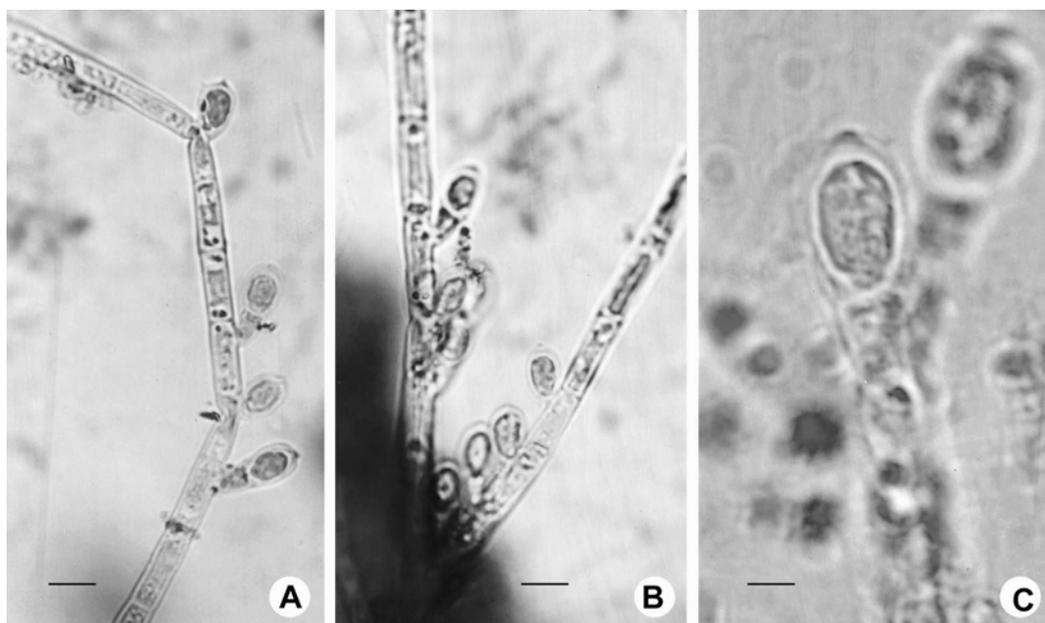


Fig. 3 A-C. *Acrochaetium sagraeanum* (Montagne) Bornet. A. Main filament with stalked and sessile monosporangia; note some plate-like chloroplasts with one pyrenoid at each end; B. monosporangia on main axis and branch; C. Ovoid monosporangia showing nipple-like structure (apiculum) at the apices. Scales: A-B = 10  $\mu\text{m}$ , C = 5  $\mu\text{m}$ .

*Reproductive structures:* Monosporangia stalked or sessile, ovoid, about 10.16-12.70  $\mu\text{m}$  long and 7.62-8.89  $\mu\text{m}$  broad, sometimes secund, apex highly thickened, sometimes appearing as slightly pointed nipple like structure (apiculum); in branches monosporangia develop near the base.

Presence of well-marked apiculum resembles with *A. chnoosporae* but present material differs in size of cells and shape of monosporangia which resemble *A. sagraeanum*.

*Habitat and local distribution:* Epiphytic on *Struvea anastomosans* (Harv.) Picc., St. Martin's Island, Cox's Bazar, collection no. 212; common.

*Geographical distribution:* Atlantic Islands: Bermuda; North America: Connecticut, North Carolina, Virginia; South America: Barbados.

4. **Acrochaetium zosterae** Papenfuss

(Fig. 4 A-C)

(Taylor 1957, 218, Pl.33, Figs 5-7)

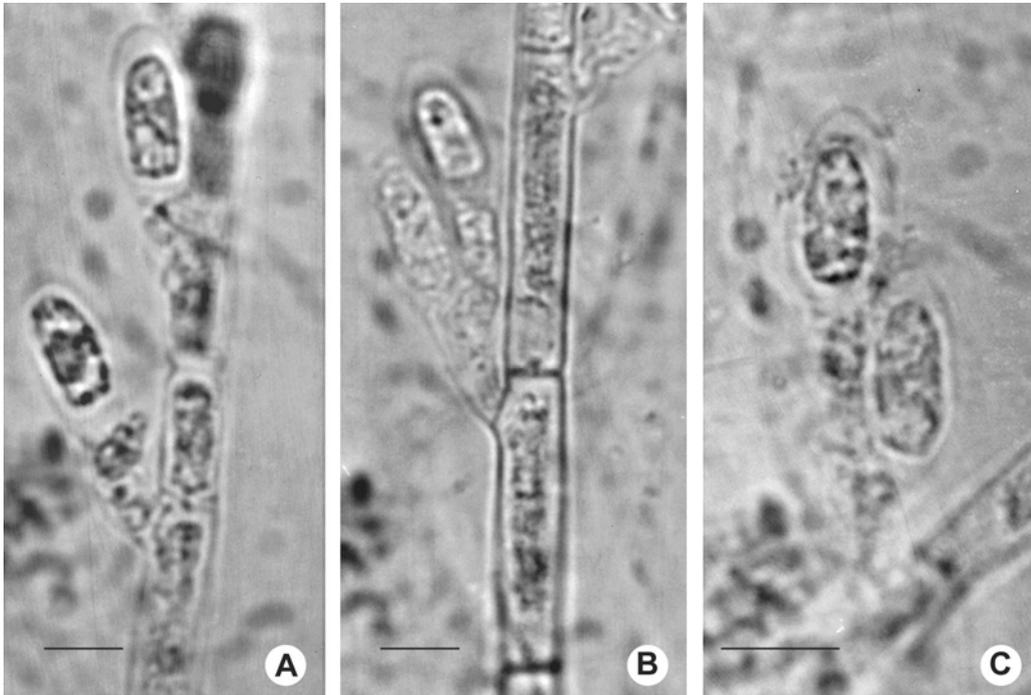
*Synonym: Acrochaetium subseriatum* Jao*Habit:* Plants simple, uniseriate, branched, about 2.2 mm high.*Vegetative structure:* Thallus with numerous branchlets unilateral or alternate; cells 12.70-15.24  $\mu\text{m}$  long and 1.00-3.81  $\mu\text{m}$  broad mostly 4-5 times as long as broad; cells cylindrical, very rarely develop into terminal hairs; chromatophores single, plate-like, with one pyrenoid.

Fig. 4 A-C. *Acrochaetium zosterae* Papenfuss. A. Portion of a plant showing lateral stalked monosporangia on the main filament; B-C. Monosporangia on lateral branches. Scales = 5  $\mu\text{m}$ .

*Reproductive structures:* Monosporangia mostly in series on the branchlets, sessile or 1-celled stalks, unilateral near the base of branchlets, rarely scattered, cylindric-obovoid (Fig. B, C), 7.62-10.16  $\mu\text{m}$  long, 3.81-5.08  $\mu\text{m}$  broad.

*Habitat and local distribution:* Epiphytic on *Struvea anastomosans* (Harv.) Picc.; St. Martin's Island, collection no. 212.

*Geographical distribution:* North America: Massachusetts.

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