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BRACKISH WATER ALGAE FROM BANGLADESH. I. *BIDDULPHIA* SPP.

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Abstract

Examination of brackish water algal samples revealed the presence of *Biddulphia aurita* (Lyngbye) Brebisson & Godey var. *obtusa* (Kützing) Hustedt, *B. dubia* (Brightwell) Cleve *fa.* and *B. pulchella* Gray hitherto not reported from Bangladesh. These are described and illustrated in this article.

Introduction

Marine phytoplankton from the north-eastern part of the Bay of Bengal in the Bangladesh territory were first reported by Islam and Aziz (1975). Occurrence of diatom-bloom consisting of a species of *Biddulphia* and *Asterionella glacialis* Castracane, in the coastal area of Teknaff was studied by Islam and Morshed (1985). While inspecting brackish water algal samples, the author came across with a large number of diatom cells, both planktonic and attached. These on examination were found to be species of *Biddulphia*, which were not reported earlier (Islam and Aziz 1975, 1980).

Materials and Methods

Some formalin preserved *Polysiphonia* (red alga) and *Lyngbya* (blue-green alga) samples collected from brackish water zones (Mongla Port area) by students of B. L. University College, Khulna, Bangladesh, were studied and were found to contain some attached diatoms. The author collected some plankton samples in March 1995 from the Naff River estuary, east of Teknaff Market place, Cox's Bazar, Bangladesh which was found to contain a large number of diatom cells. The samples were studied in water mount without any maceration, under a compound microscope fitted with auto-exposed camera.

Results and Discussion

The three species of *Biddulphia* recorded in the collections are described and discussed below.

Family: Biddulphiaceae Sub-family: Biddulphioideae

Genus: *Biddulphia* Gray

1. *Biddulphia aurita* (Lyngbye) Brebisson & Godey var. ***obtusa*** (Kützing) Hustedt **(Fig. 1)**

(Cupp 1943, 161-163, Fig. 112-B)

Cells box-shaped in girdle view, united by thick mucilage pad in a zigzag chain and remain attached. Valves elliptical-lanceolate; valve mantle short, valve zone and girdle zone divided by deep groove, valve centre almost flat but depressed sub-centrally thus producing obtuse, short processes marginally; valves without central spine. Girdle zone outstanding, intercalary bands several. Cell wall strongly siliceous, areolated punctuated; punctae 8 - 10 in 10 µm; cells 24 - 30

µm long, 30 - 60 µm wide. Chromatophores numerous, short cylindrical and aggregated in the centre.

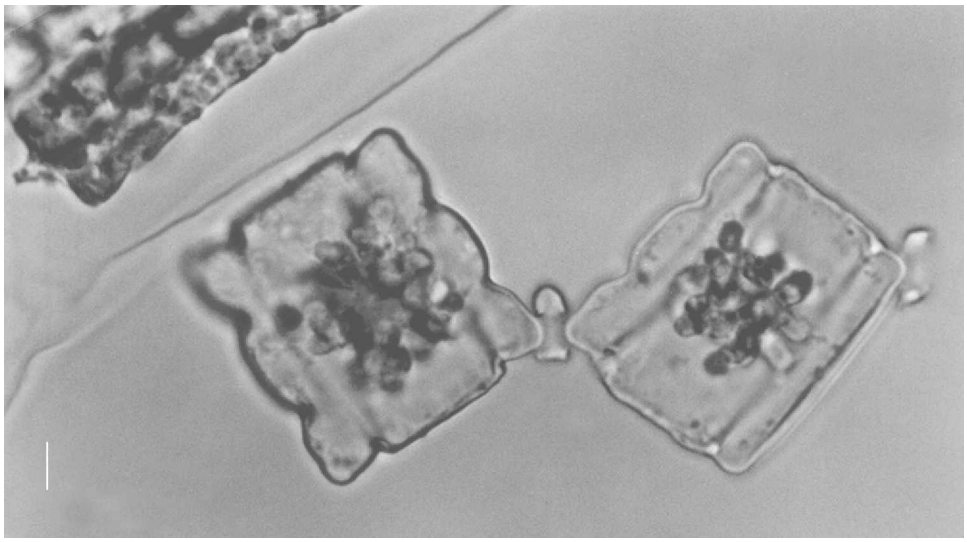


Fig. 1. Photomicrograph of *Biddulphia aurita* (Lyngbye) Brebisson & Godey, var. *obtusa* (Kützing) Hustedt, a colony of two cells attached to *Polysiphonia* sp. Bar = 10 µm.

Cupp (1943) described the variety from the west coast of North America, where the chromatophores were shown to be distributed throughout the cell (Fig. 112-B*b*).

The diatom colony was commonly found epiphytic on *Polysiphonia* (Fig. 1), a red alga, collected from the surface of a boyar at Mongla port (brackish water).

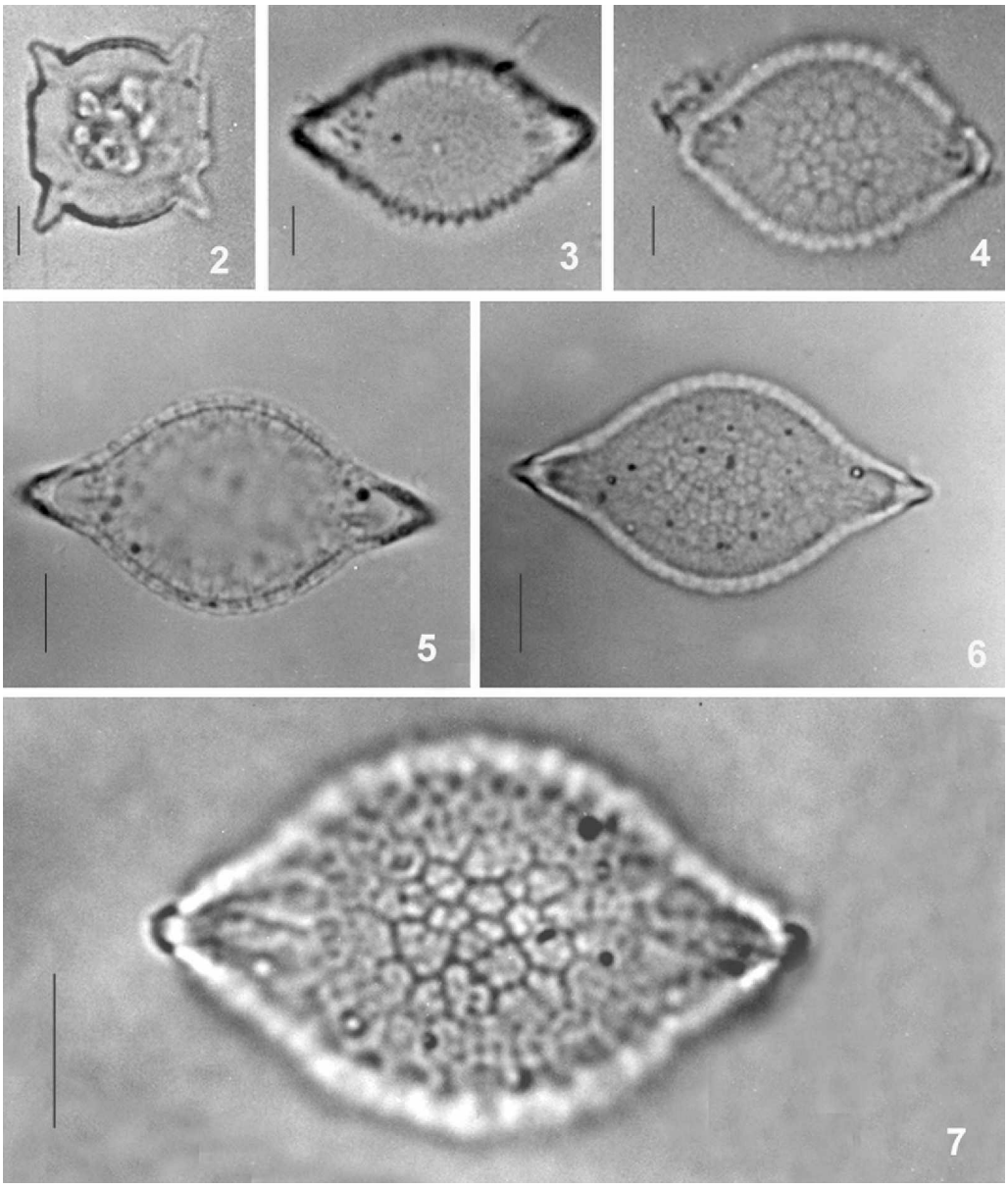
Distribution: Littoral, Arctic to north temperate species; fairly common off Scotch Cap, Alaska (Cupp 1943), and Madras coast (Subrahmanyan 1946).

2. *Biddulphia dubia* (Brightwell) Cleve *fa.* **(Figs. 2-7)**

(Cupp 1943, 164-165, Fig. 114)

Cells box-shaped, valves rhombic-elliptical; valve mantle short, valve zone and girdle zone deeply divided, valve centre strongly convex with notch peripherally producing obtuse, short processes (Fig. 2); valve surface appears to have small spines but these might be raised wall of reticulations (Figs. 3, 4); the base of each process possesses a short spine almost parallel to the angle of the process (Figs. 5, 6) making it difficult to observe; central spine absent. Girdle zone outstanding, intercalary bands several. Cell wall strongly siliceous, coarsely reticulated, 1.5 - 3.0 mesh per 10 µm on the valve centre, meshes are smaller on the periphery. Reticulations irregular or quadrangular to heptagonal and unequal in size (Fig. 7). Each reticulation with two to eight distinct punctae, 7 - 9 in 10 µm. Cells 30 - 55 µm long, 30 - 70 µm broad. Chromatophores numerous, irregular to short cylindrical and aggregated in the centre.

Cupp (1943)'s drawing (Fig. 114e) resembles largely to the present one in girdle view; the valve view however, is very different, i.e. the sides of the valve is nearly angular. The sides of valve of the present material are clearly convex, giving ellipsoidal to elliptic shape.



Figs. 2-7. *Biddulphia dubia* (Brightwell) Cleve *fa.* Fig. 2. A cell in girdle view. 3-7. Valve views of cells, short spine at the base of processes are visible; distinct reticulations and punctae are visible in Fig. 7. Bar = 10 µm.

Islam and Morshed (1985) recorded *Biddulphia* sp. from areas near Teknaff and St. Martin's Island. The present sample was also collected from nearly the same area, i.e. the Naff river estuary, east of Teknaff Market place. The morphology of girdle & valve views and the processes are similar to the present one. The diatom reported by Islam and Morshed (1985) thus could be named as *Biddulphia dubia* (Brightwell) Cleve *fa.* They observed its occurrence in blooms along with *Asterionella glacialis* Castracane during May to July (up to September). The concentration of *Biddulphia dubia* (Brightwell) Cleve *fa* population in June was as low as 5 - 10%, while from July to September it gradually rose to 40%.

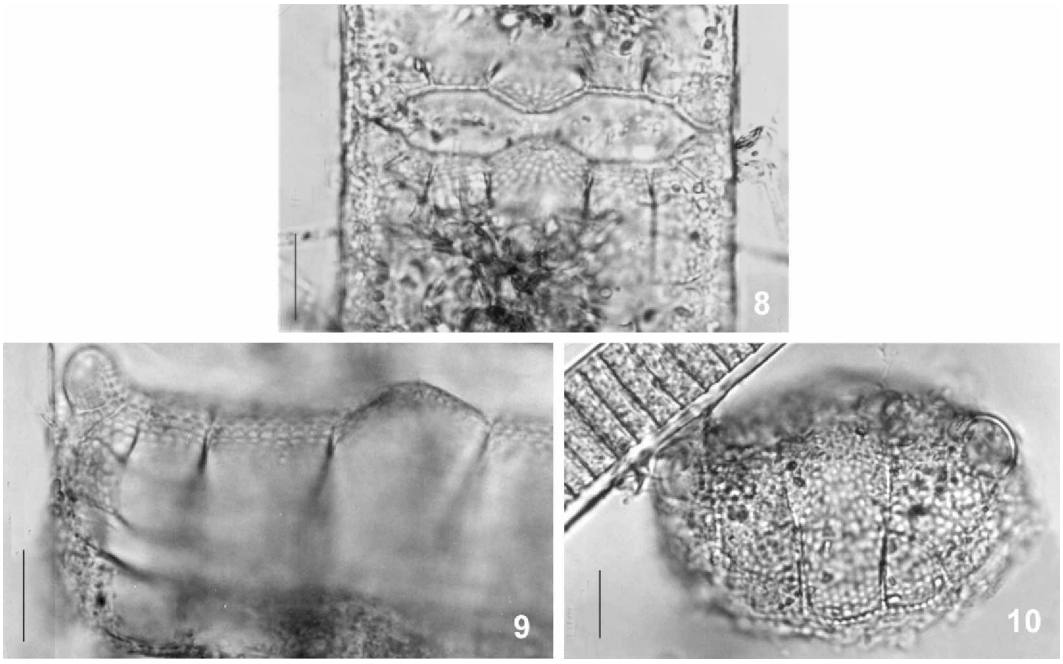
Distribution: Estuary of the Naff River, and neretic zones of Shahapuri Island up to Shidkhali, and St. Martin's Island, Cox's Bazar, Bangladesh (Islam and Morshed 1985); warm-water species; subtropical to tropical, only occasionally reported off southern California (Cupp 1943).

3. ***Biddulphia pulchella*** Gray **(Figs. 8-10)**

(Cupp 1943, 152, Fig. 109; Subrahmanyan 1946, 154, Figs. 283-284)

Synonym: Biddulphia biddulphiana (Smith) Boyer

Cells box-shaped, united by thick mucilage pad in a straight chain, attached to adjacent cell by horns. Valves elliptical with undulated sides traversed by 4 - 6 ribs; valve surface slightly concave but raised into a nearly conical structure centrally; central spines absent. The margin of a valve



Figs. 8-10. *Biddulphia pulchella* Gray. Fig. 8. Divided cells in girdle view, showing undulated aperture between cells, note the almost conical raised area in the valve centre. Fig. 9. A portion of a valve highly enlarged showing ornamentation and ribs. Fig. 10. Valve view of a cell attached to *Lyngbya* by mucilage. Bars = 10 μm.

produced into globular processes which are constricted at the base. Cell wall strongly siliceous, areolated, 4 - 6 in 10 μm; girdle band similarly areolated. Cells 50 - 80 μm long, 50 - 60 μm wide. Chromatophores numerous, cylindrical and aggregated in the centre.

The diatom was found epiphytic on *Lyngbya* and *Polysiphonia*, collected from the surface of a boyar at Mongla port as a common species.

Distribution: Littoral, temperate species becoming rare towards the north, plankton of Atlantic and Pacific coasts; one of the commonest form in the European coastal region, particularly frequent in the temperate parts (Cupp 1943, Subrahmanyan 1946). Cupp (1943) recorded this species occasionally in plankton samples but as a bottom form.

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