

## OCCURRENCE OF THE GENUS *BANGIA* LYNGBYE (BANGIALES-RHODOPHYTA) FROM CHITRAL, NORTH WEST OF PAKISTAN

MOHAMMED NIZAMUDDIN

*Department of Botany,  
University of Karachi, Karachi-32, Pakistan.*

### Abstract

A fresh water red alga, *Bangia atro-purpurea* (Roth) C. Agardh has been reported for the first time from Pakistan which was found growing in soft water channels, arising from hot waterfalls in Chitral district, north of Pakistan.

### Introduction

Among the red algae some are exclusively freshwater and some are marine as well as freshwater. No investigations on the red algae of freshwater were made in Pakistan until Faridi (1971 a, 1975) who made a detailed study on the genus *Batrachospermum*. In a diagnostic key of the freshwater algae of Pakistan, Faridi (1971b) mentioned 5 freshwater red algae viz., *Asterocystis* Gobi, *Audouinella* Bory, *Batrachospermum* Roth, *Compsopogon* Montagne and *Lemanea* Bory. Faridi's collections are not available to make any comment on their occurrence in Pakistan. In June, 1987 a team of Botanists belonging to the Flora of Pakistan Project collected some freshwater algae from Chitral district, north of Pakistan from which a red alga, *Bangia atro-purpurea* (Roth) C. Agardh was identified. This red alga is not common in freshwater and is a new record from Indo-Pak. subcontinent. This species is commonly found in freshwater in Europe and America (Smith, 1950). This species has already been reported by Moazzam & Shameel (1985) from the coastal areas of Pakistan under the name *Bangia fusco-purpurea* (Dillwyn) Lynbye.

### Material and Methods

The material collected from freshwater channel, arising from waterfalls in Chitral district was fixed in 4% formalin solution. Some specimens were mounted on herbarium sheets and distributed to several herbaria of the country and the world.

### TAXONOMIC ENUMERATION

#### *Bangia* Lyngbye 1819: 82

Thalli filamentous, erect, simple, uniserial to multiserial; massive rhizoidal holdfast; stellate rhodoplast with a central pyrenoid; reproduction by monospores; heteromorphic alternation of generations.

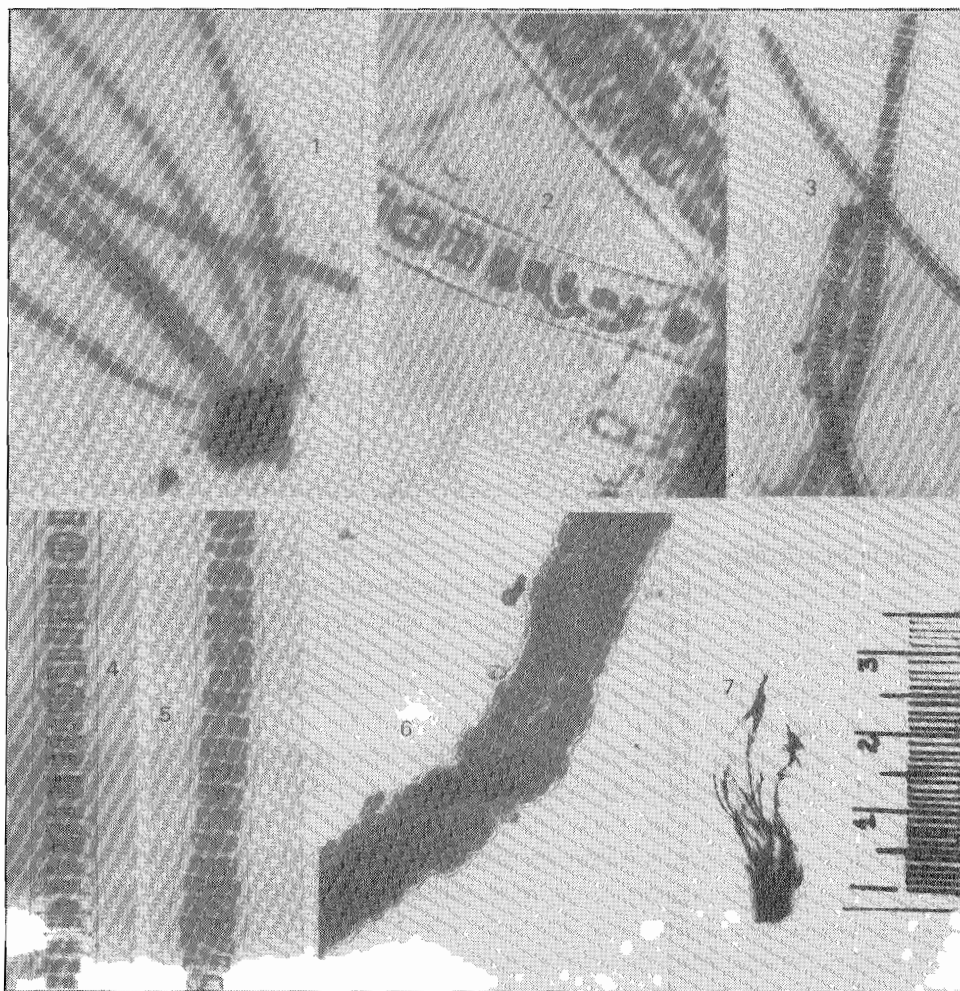


Fig. 1-7. *Bangia atro-purpurea* (Roth) C. Agardh Fig. 1. Habit of the thallus. Fig. 2. Basal part of an axis showing rhizoidal outgrowths from the cells. Fig. 3. A young axis showing apical cell and uniseriate axis. Fig. 4. A portion of a young axis. Fig. 5. A part of an axis - biseriate (upper) and triseriate (lower). Fig. 6. A part of carposporangial and multiseriate axis with constriction. (Fig. 1-6, x 500) Fig. 7. Habit of plants (Herbarium sheet).

The genus is represented by a single freshwater species, *B. atro-purpurea* (Roth) C. Agardh in Pakistan.

*Bangia atro-purpurea* (Roth) C. Agardh 1824: 76 (Figs. 1-7).

Synonyms: *Conferva atro-purpurea* Roth 1806: 208. (Type locality-Bremen, West Germany).

*Conferva fusco-purpurea* Dillwyn 1807: P1.92 (Type locality-Dunraven Castle, Glamorganshire, Wales).

*Bangia fusco-purpurea* (Dillwyn) Lyngbye 1819: 83, p1. 24. Hamel 1924: 36. Kützing 1853: 9, taf. 30. Pentecost 1984:47. Smith 1950: 611. Starmach 1977: 51.

Thalli purplish-red, soft, flaccid, caespitose, simple, erect, filamentous, first uniseriate, then biseriate due to longitudinal divisions followed by multiseriate (parenchymatous), cylindrical, 25-66 (-120)  $\mu\text{m}$  wide, constricted at the cross-walls; mature multiseriate filaments become distantly constricted; rhodoplast stellate with a central pyrenoid. Monospores spheroid, 45-60  $\mu\text{m}$ . Massive rhizoidal holdfast developing from the lowermost cells.

Locality:- Arkari Gol, 25 Km from Hot waterfalls (Garam Chashma) on way to Arkari Village, Chitral District (Leg. Abdul Ghafoor, 19-6-1987). It was found growing attached to stones in freshwater channels, arising from soft waterfalls/streams. Water temperature was between 15-20°C.

These specimens resemble those described by Pentecost (1984), Smith (1950) and Starmach (1977) in general habit but differ greatly in the width of the filaments. It is almost double the breadth of the European and American species. European species was reported from hardwater (Smith, 1950) whereas Pakistani species was found growing in soft drinking water.

*B. atro-purpurea* (Roth) C. Ag. and *B. fusco-purpurea* (Dillwyn) Lyngbye are conspecific (den Hartog, 1972., Geesink, 1973).

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