

MELANOTHAMNUS AFAQHUSAINII, A NEW RED ALGA FROM THE COAST OF KARACHI

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Abstract

Melanothamnus afaqhusainii Shameel is characterised by large size of thallus (up to 80 cm) with 7-14 celled thick cortical zone, bearing conical (spindle shaped) propagule-like bodies, up to 365 μm long x 100 μm broad, consisting of up to 21 tiers of cells and borne only on *Polysiphonia*-like dwarf branches. It differs from *S. somalensis* in all these characters.

Introduction

During a survey of red algae, *Odonthalia washingtoniensis* Kylin was found growing along Karachi coastal areas (Shameel & Tanaka, 1992). The alga was later identified as *Melanothamnus somalensis* Bornet et Falkenberg (Hayee-Memon & Shameel, 1996; Shameel et al., 1996). *Melanothamnus* Bornet et Falkenberg is considered to be a monotypic genus of Rhodomelaceae (Ceramiales), where *M. somalensis* is the only species so far reported from Somalia (Falkenberg, 1901; De Toni, 1924; Kylin, 1956), Yemen and Oman (Wynne & Banaimoon, 1990; Silva et al., 1996). A detailed investigation of the Karachi specimens and their comparison with the above plants revealed remarkable differences with larger size of thallus, size of propagules containing highest number of tiers of cells and thickest cortication of the axis. They further differ from Somalian specimens in having conical and spindle shaped propagules, and from Yemeni and Omani plants in habit and in the formation of propagules on *Polysiphonia*-like filaments i.e., dwarf shoots only. On the basis of these differences the Karachi specimens appear to constitute a separate specific entity.

Materials and Methods

External characters were studied from freshly collected specimens and cellular structures investigated from those fixed in 4% formalin - seawater solution at the spot. Selected specimens were mounted on herbarium sheets and are kept in the Seaweed Herbarium (KUH-SW), MAHQ Biological Research Centre, University of Karachi.

Melanothamnus afaqhusainii Shameel sp. nov.

Figs. 1a,b & 2a,b

Misapplied names: *Melanothamnus somalensis sensu* Ahmad et al., 1996: 1141-1142; Hayee-Memon & Shameel, 1996: 133-134, figs. 19a-d; Shameel et al., 1996: 228-229;

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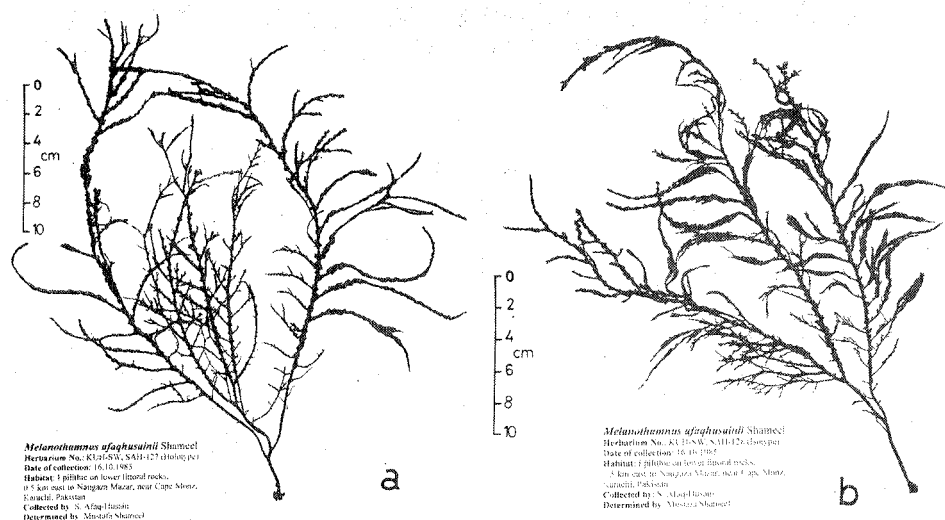


Fig. 1. *Melanothamnus afaqhusainii* sp. nov. Plants showing habitat: a. Holotype, b. Isotype.

Atta-ur-Rahman *et al.*, 1997: 86-97, tab. 1; *non* Bornet *et* Falkenberg in Falkenberg, 1901: 684-688, pl. 21: figs. 14-18. *Odonthalia washingtoniensis sensu* Shameel, 1990: 430, tab. I; Shameel & Tanaka, 1992: 54; *non* Kylin, 1925: 76.

Description: Thalli up to 80 cm long, much branched, reddish brown to reddish black, tough (Fig. 1a); initially attached by a small discoid holdfast, which gradually increases up to 5 cm diam. by elongation of cells in the form of small rhizoidal projections; primary axis terete or cylindrical, up to 4 mm diam., bearing small to large branches irregularly and radially at varying distances, their width decreases with increase in the order of branching; large branches repeatedly behave similarly up to 5th order (Fig. 1b); small branches terete to compressed, appearing distichous and dentate by further branching; small tufts of special, minute, filiform, dwarf branches, up to 3.5 mm long, 90-130 μm broad, resembling *Polysiphonia*-filaments, producing propagule-like bodies; propagules spindle shaped, broader in the middle, becoming conical at distal end with a clear dome shaped apical cell (Fig. 2a), 240-300 (-365) μm long, 70-90 (-100) μm broad in the middle, consisting of 13-18 (-21) tiers of cells including apical cell, capable of growing by means of rhizoids (Fig. 2b); C.S. of frond shows a small axial cell in the centre, 30-100 μm broad, surrounded by 4 pericentrals, up to 350 μm broad, surrounded by 2-3 layers of similar cells, up to 650 μm broad, surrounded by 7-14 celled thick cortex.

Latin diagnosis: *Plantae rubens-brunneus ad rubens-nigerens, tenax, usque ad 80 cm longae; hepton usque ad 5 cm diametro; primarii axis teres vel cylindrica, usque ad 4 mm diametro; rami parvo grandis, irregularis et radialis; rami parvi teres ad compressus, distichus et dentatus; parvus caespes specialis, minutis, filiformis, Polysiphoniatus nanus ramus, usque ad 3.5 mm longus, 90-130 μm latus, propagulus producens;*

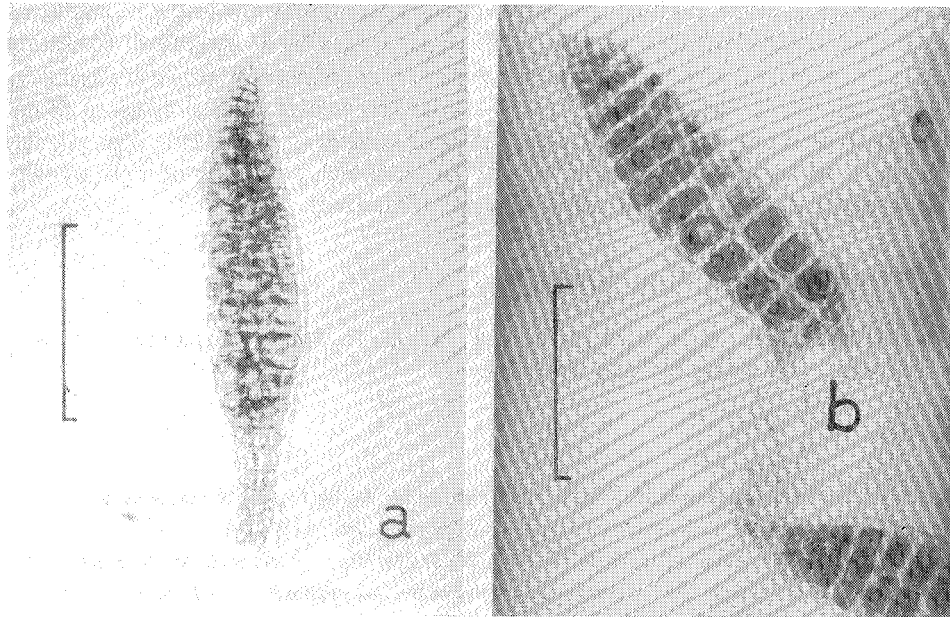


Fig. 2. *M. afaqhusainii* : a. Propagule having 18 tiers of cells ($209 \times 63 \mu\text{m}$) + 6 tiers of stalk ($70 \times 30 \mu\text{m}$). b. Propagule with rhizoid from basal part, cells in apical part also elongating (scale for a = $112 \mu\text{m}$ & b = $150 \mu\text{m}$).

propagulis fusiformis, 240-300 (-365) μm longis, 70-90 (-100) μm medio latis, constans 13-18 (-21) seriata cellula, includens cellula apicalis tholiformis; axiali cellulis 30-100 μm latis, 4 pericentralis usque ad 350 μm latis, 7-14 cellularis crassi corticalis.

Type locality: Naugaza Mazar, near Cape Monze, Karachi, Pakistan.

Holotype: KUH-SW, SAH-127 (Fig. 1)

Local distribution: Epilithic as dense bushes on lower littoral rocks exposed to strong wave action at Manora (Leg. M. Shameel 15-10-1993), Buleji (Leg. S. Afaq-Husain 17-10-1985, 12-11-1985, 7-10-1986, 27-9-1988, 16-9-1989, 9-9-1991; M. Shameel 10-10-1990, 27-10-1990, 13-11-1993, 9-10-1995), Paradise Point (Leg. S. Afaq-Husain 23-12-1988; M. Shameel 28-9-1992), Naugaza Mazar (Leg. S. Afaq-Husain 16-10-1985, 6-10-1986), Cape Monze (Leg. M. Shameel 7-11-1992).

Discussion

The new species, *M. afaqhusainii*, has been named after Dr. Syed Afaq-Husain, Principal Scientific Officer, Applied Biology and Marine Resources Research Centre, P. C. S. I. R. Laboratories Complex, Karachi, who has made significant contributions on the taxonomy and phytochemistry of marine Rhodophyta from the coast of Pakistan. It differs from *M. somalensis* in height, thickness of cortex, shape of propagule-like

bodies; which is 30-36 cm high, has a few celled thick narrow cortical zone and bears club shaped brachyblasts (propagules), 200-210 μm long x 68-84 μm broad, consisting of 13-15 tiers of cells and borne in the distal portion of common branches (Falkenberg, 1901; Kylin, 1956; Wynne & Banaimoon, 1990). The present species is up to 80 cm high, has 7-14 celled thick cortical zone and bears conical (spindle shaped) propagule-like bodies, which are up to 365 μm long x 100 μm broad, consisting of up to 21 tiers of cells and borne only on Polysiphonia-like dwarf branches.

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