

ADDITION TO THE SPECIES OF *DILOPHUS* J. AGARDH AND *SPATOGLOSSUM* KUETZING (PHAEOPHYTA-DICTYOTALES) FROM THE COAST OF KARACHI, PAKISTAN

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Abstract

The taxonomy and morpho-anatomy of *Dilophus fasciola* (Roth) Howe var. *repens* (J. Agardh) Feldmann and *Spatoglossum australasicum* Kuetzing is reported for the first time from the coast of Karachi.

Introduction

Members of the order Dictyotales thrive luxuriantly at Karachi coast and are represented by 7 genera and 30 species (Begum & Khatoon, 1988). Nizamuddin & Perveen (1986) have reported some members of Dictyotales viz., *Lobophora* J. Agardh, *Stoechospermum* Kuetzing and *Stypopodium* Kuetzing including the two species of *Spatoglossum aspernum* J. Agardh and *S. variable* Figari et De Notaris from this coast. During a survey of brown algal flora from 1982-1988, *Dilophus fasciola* (Roth) Howe var. *repens* (J. Agardh) Feldmann and *Spatoglossum australasicum* Kuetzing were recorded for the first time from the coast of Karachi. Both the species are annual and may be collected once or twice during a year. The specimens of *Spatoglossum australasicum* Kuetzing was rare and also a deep water alga, therefore, always collected as drift but *Dilophus fasciola* var. *repens* was found to grow on mid to lower water mark. The taxonomy and morphoanatomy of *Dilophus fasciola* (Roth) Howe var. *repens* (J. Agardh) Feldmann and *Spatoglossum australasicum* Kuetzing is reported for the first time from the coast of Karachi.

Materials and Methods

Specimens of brown algae were collected from Manora, Sandspit, Buleji, Paradise Point and Cape Monze and preserved in 4% formalin-sea water for morpho-anatomical and reproductive studies. Herbarium sheets were prepared and kept in the Phycology section, Department of Botany, University of Karachi. All diagrams were made by Camera Lucida.

DESCRIPTION OF THE TAXA

Dilophus fasciola (Roth) Howe var. *repens* (J. Ag.) Feldmann (Figs. 1 A-B, 2, 5 A-C).

Bas: *Dictyota repens* J. Agardh 1848:89. Kuetzing 1859:5, t.9,f.1.

Syn: *Dictyota simplex* Kuetzing 1859: 5, t. 9, f. 2. *Dictyota denticulata* Kuetzing 1859:12, t.28,f.1. Nizamuddin 1981: 59; Begum & Khatoon 1988: 297.

Plants small, upto 1.5 cm high, repent, grow in tufts; segments much entangled with each other, forming ball-like structure; segments linear 0.7-1 mm broad; plant sub-dichotomously and irregularly much branched; sinuses obtuse; apices narrowly round to

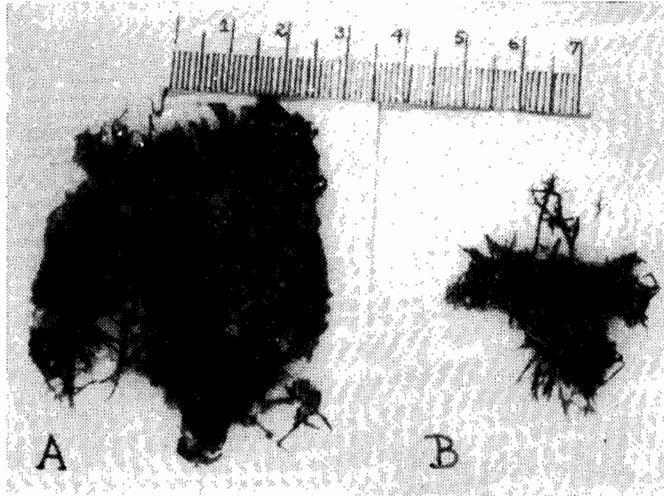


Fig.1. *Dilophus fasciola* (Roth) Howe var. *repens* Feldmann: A and B. Habit of the plant.

obtuse, sinuses divaricated; margin entire or teethed or with spines; surface cells twice longer than breadth, arranged in longitudinal rows, chromatophores discoid, dense at the center and arranged at the margin; growth by single apical cell.

In T.S. upper part thin, middle and lower part thick; upper part 3(-4) layered, 85 μm thick; medullary cells squarish or broader than length, 25 μm high, 35 μm broad, mostly with dense chromatophores in the center; assimilatory cells 15 μm high and broad. Middle part 4 layered, 110 μm broad; medullary cells 35 μm high, 40 μm broad; assimilatory cells 20 μm high, 25 μm broad. Lower part 4-5 layered, 140 μm thick; medullary cells mostly irregular in shape, 30 μm high, 40 μm broad; assimilatory cells 20 μm high, 25 μm broad, surrounded by thick cell wall.

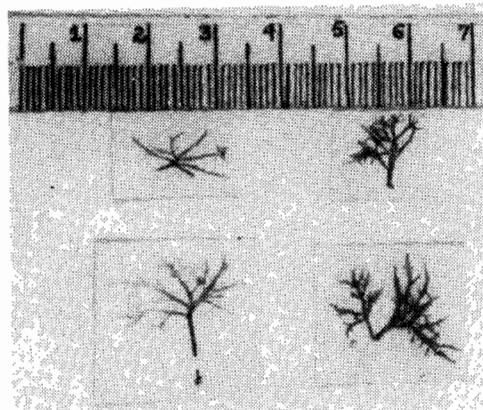


Fig.2. *Dilophus fasciola* (Roth) Howe var. *repens* Feldmann: Branching pattern and shape of the segment.

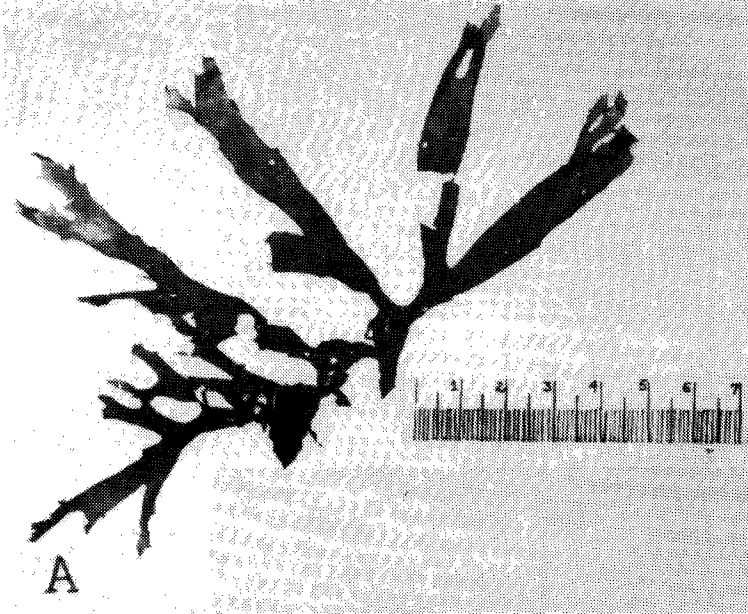


Fig.3. *Spatoglossum australasicum* Kuetzing: Habit of the plant.

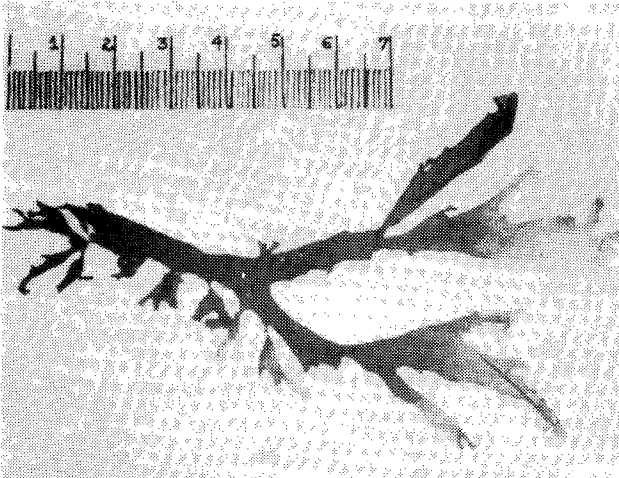


Fig.4. *Spatoglossum australasicum* Kuetzing: Part of plant with dentate and proliferated margin.

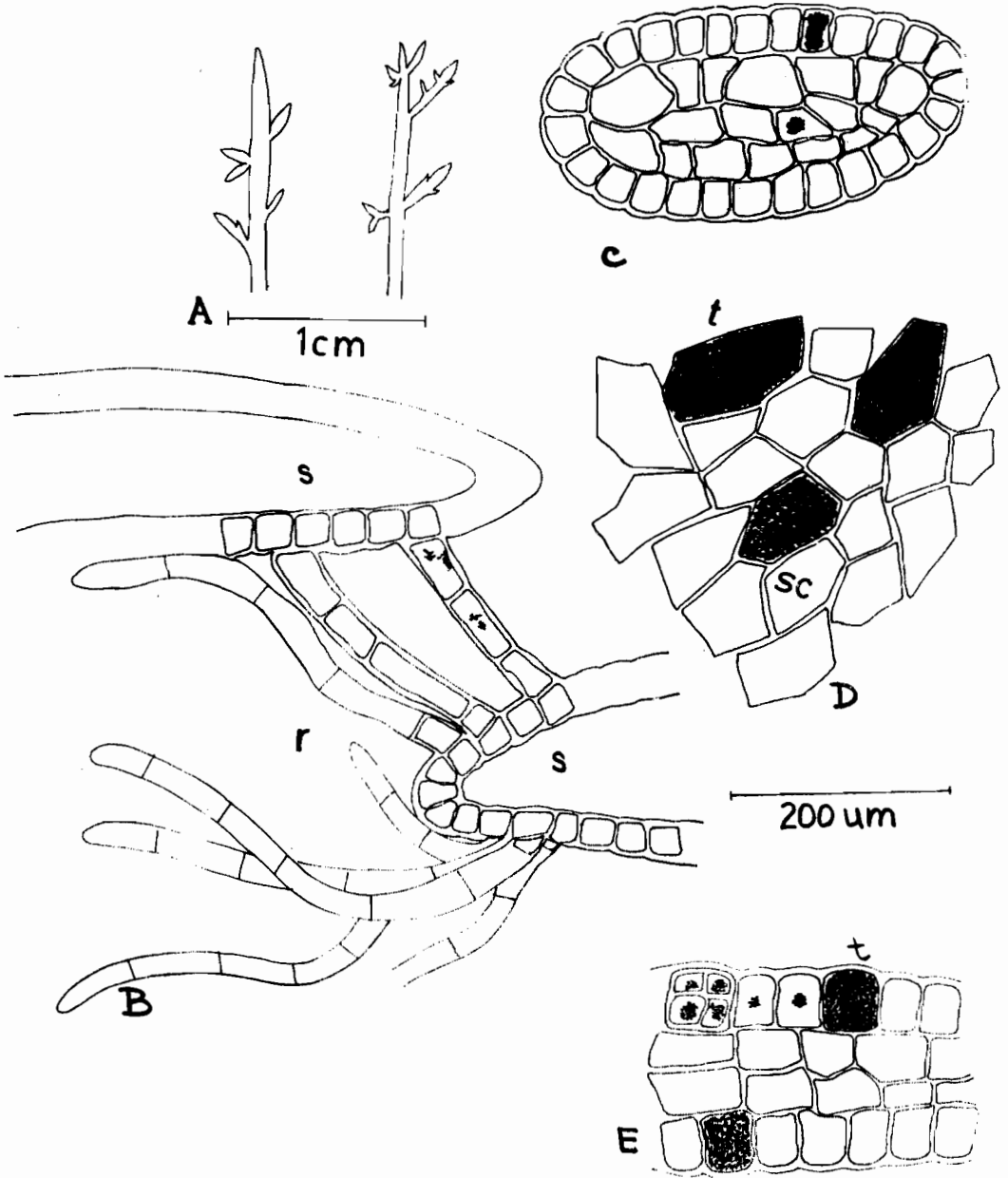


Fig.5. *Dilophus fasciola* (Roth) Howe var. *repens* Feldmann: A. Apical part of the segment; B. The T.S. showing attachment of the lower segments by rhizoids; C. The T.S. of the lower part of the thallus. *Spatoglossum australasicum* Kuetzing: D. Large surface cells with tetrasporangia; E. The T.S. of the thallus with tetrasporangia. (r = rhizoids, S = segment, Sc = surface cells, t = tetrasporangia).

The lower segments of the thallus are attached to each other by means of rhizoids.

Local distribution: Manora (Leg. M. Begum & N. Khatoon, 4.5.1984; 2.6.1984). Buleji (Leg. M. Begum & N. Khatoon, 26.1.1983).

Geographical distribution: Mediterranean Sea: Morocco, France, Libya and Karachi (Pakistan).

Ecology: Grows on sand covered rocks and flat sandy areas from middle to lower water mark.

Pakistani specimens resemble with the Libyan specimens (Nizamuddin, 1981) in all aspects except in small sized plants and absence of proliferations which may be due to smaller sized plants.

***Spatoglossum australasicum* Kuetzing 1859 (Figs. 3,4,5 D-E) Kuetzing 1859: 20, Pl. 48, Fig. 11; Womersley 1967: 223, 1987: 235.**

Plant small, thin upto 11 cm long; plant dichotomously, subdichotomously or irregularly branched, branching at 0.5-3.5 cm distance; sinuses broadly round or obtuse; segments small, narrow, 3-10 (-16) mm broad, broad before bifurcation; apices acute, irregular; margin wavy, dentate or serrate when young, become much proliferated when old; surface cells 25 x 48 μm across.

In T.S. upper part of the thallus 3-4 layered, 130 μm thick; medullary cells mostly broader than length, irregular, 25 μm high, 40 μm broad; assimilatory cells large 40 μm high, 46 μm broad; chromatophores dense at upper 1/4 region of the cells or parietal. Lower part 4-(-5) layered, 188 μm thick; medullary cells 42 μm high, 50 μm broad; assimilatory cells squarish and mostly broader than length, 45 μm high, 50 μm broad, assimilatory cells divided into 2-4 cells.

Tetrasporangia blackish brown, round, squarish or elongate in shape, scattered on both surfaces, single or in group of 2-(-3) in surface view. In T.S. 86 μm high, 70 μm broad.

Local distribution: Manora (Leg. M. Begum & N. Khatoon, 31.3.1982; 9.4.1982; 7.4.1984. A. Begum & R. Latif, 16.1.1988. A. Tahir & F. Mahmood, 13.3.1988). Sandspit (Leg. M. Nizamuddin, 1.1.1963; 1.1.1964). Paradise Point (Leg. M. Begum & N. Khatoon, 9.4.1982; 7.4.1984; 4.5.1984). Cape Monze (Leg. M. Nizamuddin, 28.12.1963).

Geographical distribution: The Gulf region of South Australia, Karachi (Pakistan).

Ecology: Collected as drift.

Pakistani specimens resemble very well to the description and photographs given by Womersley (1987) from South Australia.

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