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BALL FORMING EPIPHYTIC ALGA *CLADOPHORA COELOTHRIX* KÜTZING ON PNEUMATOPHORES OF *AVICENNIA MARINA* (FORSSK.) VIERH.

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Abstract

Occurrence of *Cladophora coelothrix* Kützing on pneumatophores of gray mangrove *Avicennia marina* (Forssk.) Vierh., was observed which has not been reported before. The species formed ball like algal mass clasping firmly to the protruding slender aerial roots.

Introduction

Benthic and epiphytic algae in mangrove environment contribute significantly to the carbon budget of mangrove ecosystem. Although they are very minute in size, the annual production may equal or even exceed that of mangroves (Rodriguez & Stoner, 1990). This is because of their high rate of turnover. Algal epiphytes on mangrove pneumatophores and other aerial roots have been reported from several places in the world (Taylor, 1960; Islam,1973; Tanaka & Chihara, 1985; Venkataraman, 1961). They are known to grow sometimes so abundantly that they form a thick felt like covering around the exposed parts of the pneumatophores. In Pakistan, they have been reported from Karachi and Gawatar Bay, Balochistan (Tanaka & Shameel, 1992; Saifullah & Taj, 1995; Saifullah *et al.*, 1997). The present paper reports for the first time ball forming epiphytic alga *Cladophora coelothrix* Kützing on the pneumatophores of *Avicennia marina* (Forssk.) Vierh., growing in Miani Hor, Balochistan.

Material and Methods

The study site, Miani Hor, is a lagoon located at the Balochistan and Sindh borders about 100km away from Karachi (Saifullah & Rasool, 2000). The epiphytic alga was collected at the mouth of Porali river. It was fixed in 4% formalin on the spot and later brought to the laboratory. Water temperature measured by a thermometer was 26°C and salinity by a refractometer was 44 ppt.

Observations and Discussion

A visit to the Porali river delta in Miani Hor about 100 Km from Karachi on 11.11.2001 revealed the occurrence of dense green balls of *Cladophora coelothrix* Kützing in exposed areas within dense mangrove stands. It was epiphytic on the pneumatophores forming a ball like algal mass (Fig. 1). Its taxonomic description is given below.

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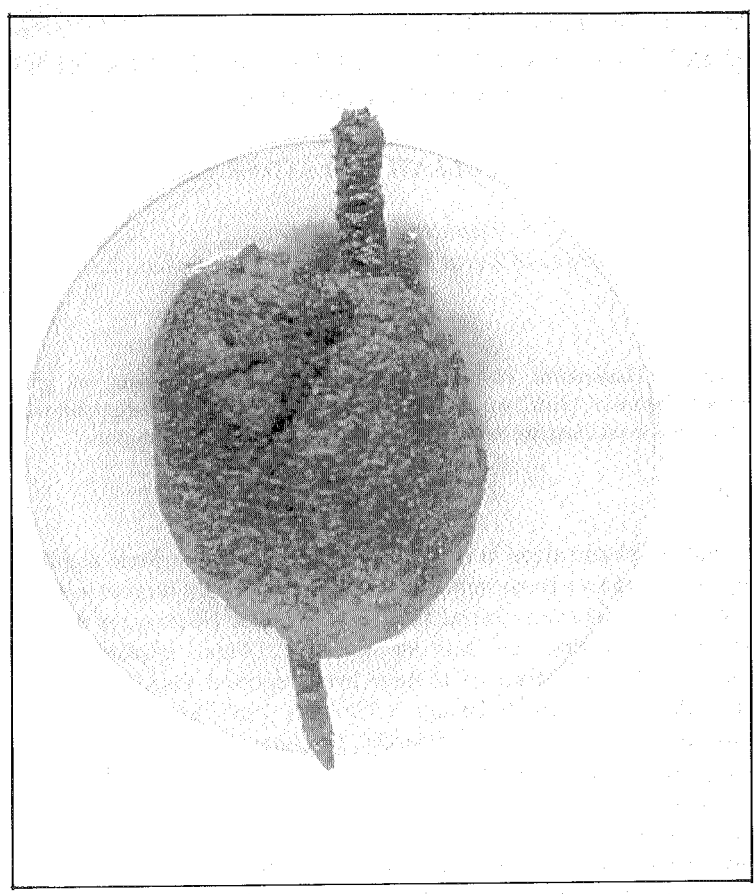

Fig. 1. A single ball of *Cladophora coelothrix* Kützing epiphytic on a pneumatophore of *Avicennia marina* (Natural size).

Thallus forming balls of varying sizes with diameter extending to several centimeters, when pneumatophores growing closely the balls merged with each other to form a compact cushion of algal mass; balls not covering the entire length of the pneumatophore but having a portion free at apex and base. Thallus profusely branched (Fig. 2a) showing no acropetal order of branching; branches arising subterminally from the apical part just below the septum of the upper cell, lateral branches inserted with inclined walls cutting off from the parent cells; upper cells of lateral branches usually curved (Fig. 2b) perhaps
to hold the ball like structure; rhizoids not long and frequent, arising from cells at the basal part; cells upto 10 times as long as broad. Cells of main axis longer (580-1000μm) and also broader (85-114μm) than branches (length 377-700μm; breadth 67-85μm). In general, cells upto 10 times as long as broad, apical cells usually swollen (Fig. 2b).

Begum & Nizamuddin (1973) reported 18 species of *Cladophora* Kützing, among which *Cladophora coelothrix* Kützing occurred as lose balls free floating in Hawkes Bay. They never reported this species occurring as epiphyte. Perhaps, these balls were

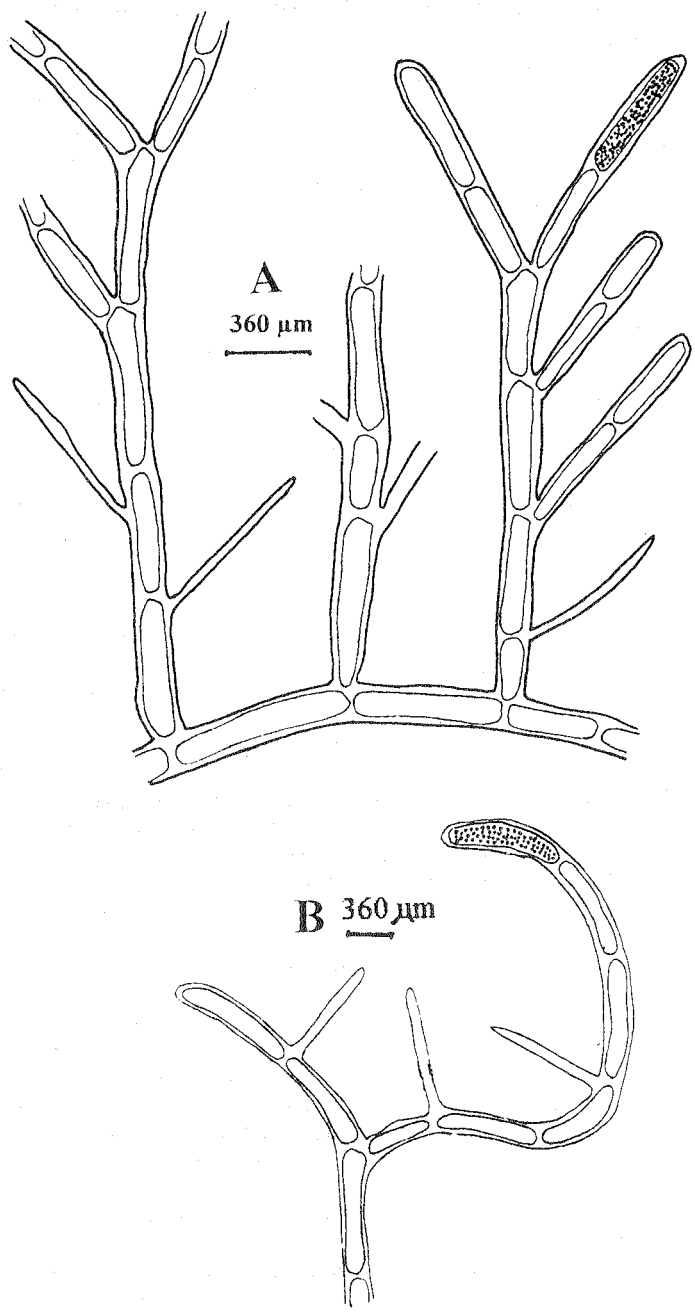

Fig. 2. a) Thallus showing profuse branching.
b) Apical part showing curved branches and swollen apical cells.

detached from the pneumatophores of near by mangroves and brought ashore by tidal flushing. The present specimen resemble closely with those described by Begum & Nizamuddin (1973) except that the cells are narrower. Shameel *et al.*, (1989) also reported this species in Lasbela but did not give any description. Hoek (1963), Feldman (1937), Hamel (1929) and Womersley (1984) observed *Cladophora coelothrix* Kützing neither as free floating nor epiphytic but as benthic form forming a few cm thick mats in shaded areas of European and Australian coastal areas.

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References

Feldmann, J. 1937. Les Algues marines de la cote des Alberes. I-III. Cyanophycees, Chlorophycees, Phaeophycees. *Rev. Algol.*, 9: 141-335.

Hamel, H. 1929. Quelques *Cladophora* des côts Francaises. *Rev. Algol.*, 4: 43-76.

Hoek, C. Van De. 1963. Revision of the European species of *Cladophora*. i-iiv +248 pp.+ 55pls. Leiden.

Islam, A.K.M.N. 1973. The algal flora of Sundarbans mangrove forest, Bangladesh. *Bangladesh J. Bot.*, 2: 11-36.

Nizamuddin, M. and M. Begum. 1973. Revision of the marine Cladophorales from Karachi. *Bot. Mar.*, 16: 1-18.

Rodriguez, C. and A. W.Stoner. 1990. The epiphyte community of mangrove roots in a tropical estuary : Distribution and biomass. *Aquat. Bot.*, 36: 117-126.

Saifullah, S.M. and G. Taj. 1995. Marine algal epiphytes on pneumatophores of mangroves growing near Karachi. *In*: *The Arabian Sea, Living Marine Resources and the Environment.* (Eds.) M.F. Thompson and N. M. Tirmizi. American Institute of Biological Sciences, Vanguard Books (PVT) Ltd. Lahore. pp. 407-417.

Saifullah, S.M., K. Aisha and F. Rasool. 1997. Algal epiphytes on mangroves of Balochistan, Pakistan. *Pak. J. Bot.*, 29: 191-197.

Shameel, M., S.A. Husain and S.S. Husain. 1989. Addition to the knowledge of seaweeds from the coast of Lasbela, Pakistan. *Bot. Mar.*, 32: 177-180.

Shameel, M., S.H. Khan. and S.A. Husain. 2000. Biodiversity of marine benthic algae along the coast of Balochistan, Pakistan. *Pak. J. Mar. Biol.*, 6: 69-100.

Tanaka, J. and M. Chihara. 1985. Taxanomic studies of Japanese mangrove macroalgae II. Two taxa of *Caloglossa* (Ceramiales, Rhodophyceae). *Bull. Nat. Sci. Mus.* Tokyo. *Ser.*, 11: 41-50.

Tanaka, J. and M. Shameel. 1992. Macroalgae in mangrove forests of Pakistan. *In*: *Cryptogamic Flora of Pakistan,* Vol. 1. (Eds.) T. Nakaike and S. Malik. Nat. Sci. Museum, Tokyo. pp. 75-85.

Taylor, W.R. 1960. Marine Algae of the Eastern Tropical and Subtropical Coasts of the Americas. The Univ. of Michigan Press, Ann Arbor. 870 pp.

Venkataraman, G.S. 1961. *Vaucheriaceae*. I.C.A..R. Monographs on Algae. Indian Agric. *Res. Inst.* Delhi. 111pp.

Womersley, H.B.S. 1984. The benthic marine flora of Southern Australia. Part.I. Government press. Adelaide, pp: 1-329.

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