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New Distributional Record of Epiphytic Diatom of *Nitzschia longissima* in Palk Strait-Scanning Electron Microscopy (SEM)

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Abstract: Epiphytic diatom of Nitzschia longissima, a species in Nitzschiaceae family was observed during our recent collection of the Seagrass Cymodacae serrulata that was originally collected from Thondi Coastal region. This is the first record of this epiphytic diatom species on Seagrass live in Thondi. Morphology, taxonomy, habitat and distribution were introduced and discussed in detail and the species, which is found epiphytic to Seagrass of Cymodacae serrulata. The Scanning Electron Microscopic (SEM) observations have extended out knowledge of taxonomy, morphology and general biology of the species.

Key words: Epiphytic Diatom · SEM · Morphology · Taxonomy · Distributional record

INTRODUCTION

Seagrass are specialized marine flowering plants adapted to the near shore environment. These form extensive meadows supporting high biodiversity [1]. Seagrass are marine angiosperms comprise a group of higher plants that have adapted to live submerge in the ocean and sea. Most temperate Seagrass meadows are nonspecific while those in tropical and subtropical areas are multispecific [2,3]. Seagrass provide a finest substrate for organisms such as bacteria, microalgae, macro algae and invertebrates [4,5] and these organisms comprise a diverse epiphytic community on Seagrass species. An importance of Seagrass meadows to the coastal marine ecosystem is not fully understood and generally under estimated. Epiphytes algae on submerged microphyte and it has functional substrates act as indicators of biodiversity and ecological status. Epiphytic diatom as a primary producer and its potentially important food sources for herbivores associated with Seagrass beds [6].

Present investigation focus to understand the occurrence, taxonomy, morphology and general biology of the species. We obtained basic biological subsequences involving the epiphytic diatom of *Nitzschia longissima* and contribute to a better understanding of its distribution and occurrence in the Thondi coastal region, Palk Strait.

MATERIALS AND METHOD

Collection of Samples: Thondi (Lat. 9°45'N and Lang. 79°3'E) is situated 40 km south of Manelmalkudi and 45 km north of Devipattinam. Thondi was popular as the historical port. Here the coastal region was muddy, swamp in nature. This coastal region was polluted by bulk quantity of domestic and agriculture waste. Anthropogenic inputs including fecal contamination also high in this area.

Random samples were collected from Thondi coastal region during the month of January 2010. *Cymodacae serrulata* is one of the most common Seagrass found in around this coastal region. This region for accumulated in five seagrass; But, *Cymodacae serrulata* is dominant growth of species in this region. Seagrass leaves were collected at 2-3m depth and the young leaves reach their maximum size. All leaves were present covered with a dense growth of diatoms. Epiphytic diatoms were removed by scarping the individual leaves in 1 cm^2 area with the tip region in spatula.

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Fig. 1: A underwater photo view of Cymodacae serrulata

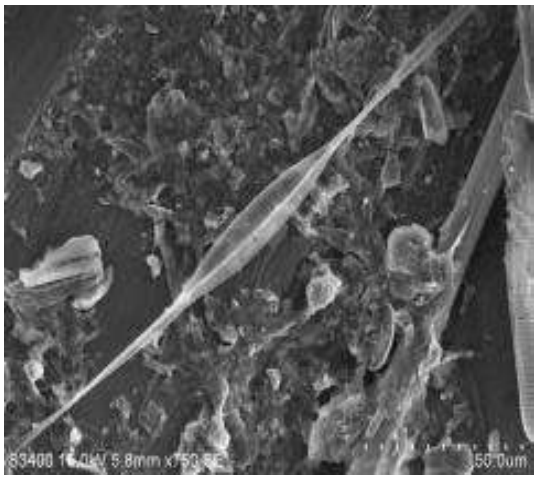

Fig. 2: SEM View of Nitzschia longissima

Acid Wash Preparation: The studies were done following hot HCl and $KMnO_4$ method (recommended technique of acid digestion) [7]. The epiphytic diatom samples subjected to Scanning Electron Microscopic observations. The SEM photos were taken at CAS in Botany, University of Madras, Guindy Campus, Chennai -25.

Scanning Electron Microscopy (SEM): The specimens were cleaned by adopting the same method as described earlier. Acid washed samples were placed onto a clean glass cover slip and the samples were left air dried overnight. The samples were coated using gold-platinum using a JEOL JFC-1600 Auto Fine Coater (JEOL, Tokyo, Japan). The samples were then examined under a JEOL JSM-6390 LA Analytical SEM (JEOL, Tokyo, Japan) and digital images were taken using the system.

Systematic Position: Nitzschia longissima (Brebirson) Ralfs.

Empire: Eukaryota
Class: Bacillariophyta
Order: Pennales
Family: Nitzschiaceae
Genus: Nitzschia
Species: longissima

Habitat: Ubiquitous, p elagic, epiphytic or attached to various soft substratums of the marine plants especially in Seagrass leaves (Figs.1 &2).

Distribution: England, France, Denmark, Virgin Islands, Shark River, New Jersey, Pacific Coast of America, Java Sea and Bay of Bengal.

Description: Cells living free singly, motile, 150-450µ long and 6-7µ broad in middle, central enlarged portion lanceolate, ends hair-like, elongated, nearly straight ends extended into long hair nearly strait, keel punctuate, 10 in 12µ and strait not recognizable (Fig.2).

DISCUSSION

Genus. *Nitzschia* can be often found in form of free living cells. [8] According to the keels are usually eccentric and can be central in some cases. The fibulae of *Nitzschia* may even extend across the valve and raphae were usually observed near the proximal margin of the valve [9].

CONCLUSION

The pinnate diatom of *N. longissima* scraped from *C. serrulata* of seagrass gives a clearer suggests the epiphytic species is able to well adapt to the marine environment. However, future studies should be carried on to clarify its complete life history and morphogenesis.

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