

## THE GENUS *OSCILLATORIA* VAUCHER (CYANOBACTERIA) FROM SELECTED MANGROVE ENVIRONMENTS OF SOUTHERN KERALA, INDIA

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### Abstract -

The present work deals with the diversity of *Oscillatoria* Vaucher from the selected mangrove environments of Southern Kerala. The genus *Oscillatoria* is the most ubiquitous genus of Oscillatoriales of Cyanobacteria growing in almost all seasons and habitat. 10 species of *Oscillatoria* (*O. subbrevis* Schmidle, *O. curviceps* C.Agardh ex Gomont, *O. limosa* C.Agardh ex Gomont, *O. chlorina* Kutzing ex Gomont, *O. princeps* Vaucher ex Gomont, *O. chalybea* Mertens ex Gomont, *O. inaequalis* (Kutzing) Bornet & Flahault, *O. acula* Bruhl & Biswas, *O. ornata* Kützing ex Gomont and *O. schultzei* Lemmermann) have been identified from different mangrove environments viz. Alappuzha (Ezhupunna, Pathiramanal), and Kottayam (Kumarakom and Mekkara) districts. The least species diversity of *Oscillatoria* in the selected mangrove areas has been recorded at Kottayam district whereas the highest species diversity at Alappuzha district.

**Keywords:** Mangroves, Cyanobacteria, *Oscillatoria*, Southern Kerala

### Introduction -

Cyanobacterial diversity in mangrove ecosystems is mainly controlled by the fluctuations in the physico-chemical characteristics of the water. The genus *Oscillatoria* is the most ubiquitous genus of Oscillatoriales of Cyanobacteria growing in almost all seasons and habitat. The species identification of Oscillatoriales has been carried out based on colour, sheath, cell measurement, constriction, granulation and end cell. The genus *Oscillatoria* is commonly identified with the visible motility of trichomes consisting of cells that are distinctly shorter than wide with a standard "ruler-like" cell division occurring in meristematic zones and, overall, simple filaments without any branching or specialized cells, such as heterocysts or akinetes (Vaucher 1803, Gomont 1892, Anagnostidis and Komárek 1988, Komárek and Anagnostidis 2005). The concept of classification of Oscillatoriales by Komárek and Anagnostidis (2005) is a comprehensive study and various taxa are arranged in a single order, 6 families and 12 subfamilies.

A survey of literature on Oscillatoriales revealed that according to the classical concept, 128 species of *Oscillatoria* has been reported from India (Tiwari *et al.*, 2007). Mangroves are occupied by numerous cyanobacterial communities and many of them are capable of nitrogen fixation (Hoffmann, 1999). The present communication is to distinguish different species of *Oscillatoria* from the selected mangrove ecosystems of Southern Kerala.

### Materials and Methods -

The samples were collected from two districts viz. Alappuzha (Ezhupunna and Pathiramanal), and Kottayam (Kumarakom and Mekkara).

**Table 1.** Study areas.

District	Place	GPS Location
	Ezhupunna	9°49' N, 76°18' E
	Pathiramanal	9°36' N, 76°23' E
	Kumarakom	9° 36' N, 76° 25' E
	Mekkara	9° 48' N, 76° 21' E

The cyanobacterial specimens were observed on the water bodies, soil, bark and pneumatophores of mangrove plants. Light-green, dark-green, dark-brown, olive coloured cyanobacterial samples were collected using forceps, needles, scalpel and knife. Photomicrographs were taken using a Leica DM 1000 LED compound microscope. Cyanobacterial identification was done using the relevant taxonomic publications.

### Result and Discussion

Cyanobacteria is one of the most important primary production groups in aquatic environments and their productivity depends greatly on them. (Kamath *et al.* 2006). A total of 10 species of *Oscillatoria* were recorded. The least species diversity of *Oscillatoria* in the selected mangrove areas has been recorded at Kottayam district whereas the highest species diversity at Alappuzha district. Pathiramanal mangrove area occupies the most diverse species of *Oscillatoria*.

**Table 2:** List of *Oscillatoria* species identified from the different study areas

No	Species identified
1.	<i>Oscillatoria subbrevis</i> Schmidle

2.	<i>Oscillatoria curviceps</i> C.Agardh ex Gomont
3.	<i>Oscillatoria limosa</i> C.Agardh ex Gomont
4.	<i>Oscillatoria chlorina</i> Kutzing ex Gomont
5.	<i>Oscillatoria princeps</i> Vaucher ex Gomont
6.	<i>Oscillatoria chalybea</i> Mertens ex Gomont
7.	<i>Oscillatoria okenii</i> C.Agardh ex Gomont
8.	<i>Oscillatoria acula</i> Bruhl & Biswas
9.	<i>Oscillatoria ornata</i> Kützing ex Gomont
10.	<i>Oscillatoria schultzi</i> Lemmermann

Taxonomic work on Cyanobacteria from mangrove environments of Southern Kerala has been ignored for a long time. In habitats such as wetlands, the high cyanobacterial diversity is beneficial for aquaculture and habitats with lower diversity are more stable, it is because variations in the abundance of individual species have less impact on the role of the entire ecosystem (Boyd, 1973). The genus *Oscillatoria* can thrive well in low to high salinity conditions and also survive in low to high temperature conditions (Naskar *et al.*, 2008).

The present findings on the distribution of the genus *Oscillatoria* conform with the observations of Selvakumar and Sundararaman (2001), Nedumaran *et al.* (2008), Sakthivel and Kathiresan (2013), Nagarajan *et al.* (2014) and Sivakamasundari and Rajendran (2015). The temperature, pH and salinity are considered an important factor in controlling the dominance of *Oscillatoria* species.

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