



Seasonal growth and spore shedding in *Lobophora variegata* (Lamouroux) Womersley ex Oliveira from Bhimili, Andhra Pradesh, India

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Abstract:

Studies were carried out on the seasonal growth and tetraspore shedding from the marine brown alga *Lobophora variegata* which occurs throughout the year on intertidal rocky surfaces of Bhimili coast near Visakhapatnam. Maximum tetraspore shedding was reported in the month of December which correlates the maximum biomass of this population.

Key words: Marine Brown alga, Biomass, spore shedding, East Coast of India.

INTRODUCTION

Several authors studied the taxonomy and morphological studies on *Lobophora variegata* (Lamouroux) Womersley ex Oliveira in different parts of the globe (Durairatnam 1961, Islam 1976, Misra 1966, Krishnamurthy & Joshi 1970, Shameel 1987, Tamara *et al.* 1997, Narasimha Rao & Murty 2012). At Visakhapatnam this brown alga occurs in the infra littoral fringe zone of the intertidal region and it was first reported by the Rao & Sreeramulu (1970). Narasimha Rao & Murty (2012) studied the seasonal growth and photochemical analysis of *Lobophora variegata* occurs at Visakhapatnam coast. In the present study an attempt was made to understand the seasonal growth pattern and biomass of this brown alga growing in the coastal waters of the Bhimili coast along with seasonal tetraspore shedding of this alga.

MATERIALS AND METHODS

Bhimili is located on East Coast of India and 22 km away from the Visakhapatnam coast. *Lobophora variegata* plant materials were collected from the intertidal rocky surfaces of the Bhimili coast during the period January to December 2012 (Fig. 1). For estimation of biomass, quadrants of 0.25 × 0.25 m were sampled on the rocky surfaces. Plant materials present in the quadrants were taken with a scalpel and brought to the laboratory in the plastic bags containing seawater to prevent drying of plants. Plant materials were cleaned properly and material was dried in an oven at 60°C. Each month 3 to 4 samples were collected and biomass was expressed as gram dry weight per m² (g.m⁻²). For seasonal spore shedding experiments, plant materials were collected from the sea shore, clean the tetrasporic parts of the plants and placed in the petri-dishes. Spore shedding experiments were conducted at room temperature (27±2°C) and the petri dishes were illuminated with a fluorescent illumination at 9μE.m⁻²s⁻¹ for 8 hours during the day from 9AM to 5PM. For counting the spores the seawater containing spores was transferred to a measuring cylinder and diluted to a known volume depending upon the quantity of the spores liberated. Spores were counted in a plankton counting chamber under a microscope. Average values of three counts were used for computing the spore output. Spore output was expressed as spores per gram fresh weight per day.



Figure 1. Plant material of *Lobophora variegata* (Lamouroux) Womersley ex Oliveira.

RESULTS AND DISCUSSION

Information collected on the seasonal changes in the biomass of the *Lobophora variegata* was presented in the table 1. Plant populations of the *Lobophora variegata* occurs throughout the year on the infra littoral fringe of the intertidal rocky surfaces. During the one year study, maximum biomass (216 g.m⁻²) was reported in the month of December and minimum biomass (63 g.m⁻²) in the month of May. Biomass of these populations increased gradually from the month of June and attained its peak in the December. Relatively higher growth of this alga was observed from October to February months.

Table 1. Monthly Biomass values of *Lobophora variegata* at Bhimili coast.

Month	Biomass (g.m ⁻²)
January	194
February	176
March	127
April	84
May	63
June	65
July	76
August	92
September	135
October	162
November	185
December	216

Table 2 shows the seasonal tetraspore shedding from the *Lobophora variegata* occurring at Bhimili coast. In, *Lobophora variegata* tetraspore production was reported in September to March months only. Maximum tetraspore production was observed in the month of January and minimum in the month of March. Populations of this alga are available throughout the year but tetraspore production was reported in certain months of the year. From April to August months no tetraspore production or shedding was observed in this alga.

Table 2. Seasonal changes in spore shedding of *Lobophora variegata* at Bhimili coast.

Month	Number of spores.g ⁻¹ .day ⁻¹
January	1,92,458
February	86,342
March	42,856
April	--
May	--
June	--
July	--
August	--
September	65,876
October	72,782
November	1,24,645
December	1,42,860

Seasonal growth and seasonal spore shedding from the brown algae such as *Padina tetrastromatica*, *Ectocarpus mitchellae*, *Rosenvingea nhatrangensis* occurring along the Visakhapatnam and Bhimili coasts have been studied by Appa Rao (1995), Narasimha Rao (1991), and Narasimha Rao *et al.* (2012). Some species of the brown algae occurring seasonally for few months while some other species occur throughout the year with changes in their biomass values (Narasimha Rao *et al.* 2012, Narasimha

Rao & Murty 2012). Narasimha Rao (1995) studied the seasonal spore shedding in *Rosenvingea nhatrangensis* from Visakhapatnam coast. Spore shedding was reported in this alga from the month of November to March with maximum spore shedding in the month of January. Ganesan *et al.* (2000) studied the seasonal changes in growth and spore shedding in *Padina boregesenii* and *Padina tetrastromatica* in the Mandapam coast. Tetraspore output from these algae showed the peak shedding in the month of December and January. Narasimha Rao *et al.* (2012) reported the seasonal growth of *Rosenvingea nhatrangensis* during November to March and spore shedding also observed from December to March. In the present study *Lobophora variegata* occurs throughout the year with maximum biomass in the month of December but spore shedding from this alga reported from September to March months with peak shedding in the month of January. This finding agrees with the earlier observations on seasonal growth and spore shedding studies along the East coast of India.

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