

A survey on macrophytic marine algae in Elathur and Kappad beach, Kerala coast

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Abstract

The marine environment represents approximately half of the global biodiversity and is an enormous resource for new compounds. Seaweeds are also known as marine macro algae and they are a habitat of both marine and brackish water environment. It is a very versatile product widely used for food in direct human consumption and also an ingredient for the global food and cosmetic industries and is used as fertilizer and as an animal feed additive. Total annual value of production is estimated at almost US\$ 6 billion of which food products for human consumption represent US\$ 5 billion. Hence a preliminary survey on the marine algal distribution along the Elathur backwaters and Kappad beach, Calicut, Kerala coast was undertaken during Jan – Feb 2015 and the list of algal species collected during the survey from the intertidal and subtidal region upto 1.5 m depth is highlighted in this paper.

Keywords: Marine environment, Marine algae, Macrophytic algae, Kerala coast

1. Introduction

Seaweeds are macrophytic algae, a primitive type of plants lacking true roots, stems and leaves. Most seaweed belongs to one of three divisions - the *Chlorophyta* (green algae), the *Phaeophyta* (brown algae) and the *Rhodophyta* (red algae). Seaweeds are found in the intertidal and subtidal region up to where photosynthetic light of 0.01% prevails in the coastal region between high tide and low tide. As the first organism in marine food chain, seaweeds provide nutrients and energy for all other living organisms (Cheong *et al.*, 2006). They also provide shelter and habitat for many coastal animals. From the time immemorial the macroscopic marine algae have been closely associated with human life and are being exhaustively used in numerous ways as a source of food, feed, fertilizer and medicine (Chapman *et al.*, 1980). Marine algae contain more than 60 trace elements in a concentration much higher than in terrestrial plants. They also contain protein, iodine, bromine, vitamins and substances of stimulatory and antibiotic nature. Seaweeds are also traditionally consumed in different parts of the world. Use of seaweed as food has strong roots in Asian countries such as China, Japan and the Republic of Korea, but demand for seaweed as food has now also spread to North America, South America and Europe. China is by far the largest seaweed producer followed by the Republic of Korea and Japan, but seaweeds are today produced in all continents.

Recently human consumption of green algae (Chlorophyceae), brown algae (Phaeophyceae) and red algae (Rhodophyceae) is high in Asia, mainly in Japan, China and Korea. Red and brown seaweeds are also used to produce hydrocolloids; alginate, agar and carrageenan, which are used as thickening and gelling agents. In Asian countries, seaweeds are often consumed as marine vegetables. Japanese people are the main consumers with an average of 1.6 kg (dry weight) per year per capita. Seaweeds can be eaten by humans as food and are sources of useful industrial products such as phycocolloids, carrageenan, alginates and agar. Some of the algae are used to prepare soil conditioner for horticulture. The phytochemicals from marine algae are

extensively used in various industries such as food, confectionary, textile, pharmaceutical, dairy and paper mostly as gelling, stabilizing and thickening agents. Thus seaweeds are the renewable living resources which are also used as food, feed and fertilizer in many parts of the world.

In recent years several seaweed industries manufacturing agar and sodium alginate have come up in India. In order to assess the seaweed potential for industrial requirements, it was felt that survey of seaweed resources along Indian coast is very essential. At present some information is available on the seaweed resources of Gujarat, Maharashtra, Goa, Karnataka, Tamilnadu Andhra Pradesh, Orissa, Lakshadweep and Andaman Nicobar Islands (Kaliaperumal *et al.*, 1987 and 1989 Anon 1989, 1990, 1993. and 1993; Gopinathan and Panigrahy 1983) [13, 14, 2, 3, 4, 9]. The information available on the seaweed resources of Kerala coast is only for the southern coast (Koshy, John 1947; Balakrishnan Nair *et al.*, 1982, 1986a 1986 b, 1990, and 1993; Sobha and Nair, 1983 and 1985) [15, 16]. For the present study a preliminary survey on the marine algal distribution along the Kerala coast particularly Elathur and Kappad beach, was undertaken during Jan – Feb 2015 and the list of species collected during the survey is presented in this paper. The nature of coastline, places of algal occurrence and their resources are given.

Materials and Methods

Kerala is situated on the southwest coast of India between the Lat. 8°20' N to 12°51' N and Long 74°53' to 77°30'E. The length of the coastline is 560 km. During the period Jan - Feb 2015, survey of algae in Elathur and Kappad beach locality along the Kerala coast was conducted. Algae were collected randomly from the intertidal and subtidal regions upto 1.5.m depth. They were sorted out, identified and liquid specimens of all species were preserved.

Results

During the survey it was observed that in the southern Kerala for about 80 km distance from Poovar to Thirumallavaram, the coast is mostly rocky. In this area rocks of different kinds

and granite stones are found in the intertidal and subtidal region with luxuriant growth of various green, brown and red algae of few seaweed vegetation is found on them. The important places where seaweed grows abundantly in this region particularly Elathur and other places include Tikkoti, Madapalli, Chambala, Mahe, Thallayi, Tellicherry and Koduvalla. The coast is sandy beyond Koduvalla upto Manjeswar in the northern border of Kerala except the occurrence of some rocks behind the light house Mount Dilli at Enikulam, Bekal port near Pallikere and Kanuthertha near Manjeswar where seaweeds grow.

The number of algal genera and species collected along the Elathur and Kappad beach, Kerala coast were given in Table 1. Totally 5 species of algae of 5 genera were recorded of which 2 genera and 2 species to Chlorophyta and 3 genera and 3 species to Rhodophyta. (Table 1.)

Discussion

The total standing crop of seaweeds in Kerala is estimated as 1000 tons (wet wt) of which 150 tons are economically important seaweeds. The abundance of seaweeds in Kerala coast is less when compared to most of the other seaweed growing areas in the country. However attempts could be made to augment the resources by enhancing the seaweed growing areas by artificial methods of providing suitable substrates. While carrying out the survey it was found that the coastal population at Tikkoti and Elathur fresh *Gracilaria corticata* var. were collected and it is used as manure for coconut plantation. Apart from this, there is no other commercial exploitation of seaweeds in Kerala coast. The present survey revealed that the seaweeds like *Enteromorpha compressa*, *Chaetomorpha antennina*, *Centroceras clavulatum*, *Grateloupia* sps. and *Gracillaria corticata* are edible and occur in appreciable quantities in Kerala coast. Thus the macro and micro algal populations of the aquatic environments provide a vast genetic resource, biodiversity and also have considerable potential for offering new chemicals, materials and bioactive compounds.

Table 1: Name of the Algae collected from Kappad beach, Elathur, Kerala coast

S. No	Name of the algae	Phylum
1.	<i>Enteromorpha compressa</i>	Chlorophyta
2.	<i>Chaetomorpha antennina</i>	Chlorophyta
3.	<i>Centroceras clavulatum</i>	Rhodophyta
4.	<i>Crateloupia</i> sp.	Rhodophyta
5.	<i>Gracillaria corticata</i>	Rhodophyta

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