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Research Article

SEASONAL VARIATION AMONG THE PHYSICOCHMICAL CHARACTERS OF THE BOTTOM SOIL OF MUTHUPETTAI MANGROVES

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ABSTRACT

Mangroves constitute one of the important parts of an estuarine of ecosystem and infact form an icon for the estuarine ecosystem. An attempt has been made to study the characters of soil sample with relation to seasons. The study revealed that the pH was high during the summer and was found to be low during the winter season. The nitrogen content of the sample between the season showed insignificant variation. The iron, zinc, Carbonate and bicarbonate and the total phosphorus were found to be trace. The analyses revealed that the physico chemical factors showed significant variation between the seasons.

INTRODUCTION

Mangroves are a group of plants that occur in the intertidal zones of the tropics and the subtropics. The mangrove community as a whole consist of salt tolerant plants of soft and swampy mud mostly trees and shrubs, with broad leathery, evergreen leaves. Mangroves make special type of vegetation that exists at the boundary. Of two environments. Using a variety of survival and reproductive strategies. Mangrove areas are one among the productive ecosystem of this planet. They serves as custodians of the juvenile stock and form most valuable biomass. The term mangroves refers to an ecological group of halophytic plant species which are known as salt tolerant forest ecosystem and provides a wide range of ecological and economic products and services and also supports a wide variety of other coastal and marine ecosystem. Mangroves occu [py less than 1% of the worlds surface (Saenger, 2002). And are found mainly between tropic of cancer and tropic of capricon on all continents covering estimated about 75% of the tropical coastal line worldwide. A rich biodiversity is observed in the mangroves with plants and animals, which are irreplaceable and form a good genetic treasure house. Mangrove wetlands are a multiple use ecosystem that provides protective , productive and economic benefits to coastal communities. Mangroves contribute to the stabilization of the shoreline and prevention of shore erosion. Mangrove trees acts as sinks which concentrate pollutants such as sewage toxic substances, pesticides, herbicides etc.

Mangroves constitute one of the important parts of an estuarine of ecosystem and infact form an icon for the estuarine ecosystem. Good mangrove vegetation is an excellent indicator of the health of coastal ecosystem. Mangrove ecosystem traps and cycles various organic materials, chemical elements and important nutrients. Coastal areas, where the fresh and marine system meet and co exist are the regions of great ecological importance. The mangroves acts as the buffer zone between the land and the sea (Siva and Sugumaran, 2013). However the coastal areas are undergoing dramatic changes due to pollution, manmade activities etc,. The uses of mangroves include control erosion, indicator for climatic change, habitat provision, water quality management, carbon sequestration, fishing, timber production education, traditional medicine, etc, (Kathiresan, 2000:Baski and Chaudhuri, 2014). During these kind of manmade activities the bottom soil of the particular habitat undergoes changes in their properties, it is essential to study the physicochemical properties is of a vital thing. Hence an attempt has been made to study the physicochemical properties of the bottom soil of the muthupettai mangrove soil.

MATERIALS AND METHODS

The soil samples (surface, 30 cm depth and 60 cm depth) were collected from the muthupet mangrove (10° 46°N; 79° 51°). The samples were collected during Jan 2014- Dec2014.The samples were brought to the laboratory aseptically. The physicochemical parameters such as pH, Nitrogen, Phosphorus, Pottassium, Calcium, Magnesium, Zinc, Iron, CO3, HCO3,

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Orgaic carbon and Organic matter were estimated by using standard procedures (Eaton *et al*., 1994). The trace metals & heavy metal were estimated at District watershed Development Agency, Tiruchirappalli, Tamilnadu, India.

RESULTS

The soil analysis revealed that the pH was high during the summer and was found to be low during the winter season. The data were represented in table I & II.

Table I Physico chemical parameters of soil sample collected from muthupet mangrove

PARAMETERS	JAN	FEB	MAR	APR	MAY	JUN
pH	8.76±0.3	8.32±0.3	8.67±0.2	8.1±0.6	8.5±0.6	9.06±0.2
Nitrogen	0.30±0.09	0.36±0.08	0.20±0.01	0.22±0.01	0.36±0.08	0.42±0.02
Phosphorus	trace	trace	trace	trace	trace	trace
Pottassium	142.8±14.57	279.1±95.20	297.2±86.77	190.4±18.2	690.6±48.81	724.7±4.21
Calcium	37.3±9.8	8.66±2.4	40±1.8	24±5.47	78.6±1.8	80.2±0.4
Magnesium	38.1±1.8	30.09±0.4	19.98±0.8	29.26±5.79	40.58±0.2	31.8±0.11
Zinc	trace	trace	trace	trace	trace	trace
Iron	trace	trace	trace	trace	trace	trace
Carbonate&Bicorbonate	trace	trace	trace	trace	trace	trace
Organic Carbon	0.034±0.01	0.04±0.02	0.03±0.001	0.02±0.001	0.34±0.01	0.32±0,01
Organic matter	0.06±0.002	0.11±0.008	0.06±0.004	0.06±0.02	0.77±0.03	0.79±0.03

Table II Physico chemical parameters of soil sample collected from muthupet mangrove

PARAMETERS	JUL	AUG	SEP	OCT	NOV	DEC
pH	8.76±0.3	8.32±0.3	8.67±0.2	8.1±0.6	8.5±0.6	9.06±0.2
Nitrogen	0.26±0.05	0.31±0.01	0.20±0.016	0.21±0.01	0.27±0.05	0.22±0.01
Phosphorus	trace	trace	trace	trace	trace	trace
Pottassium	862.0±4.121	862.7±8.6	341.4±3.3	332.5±6.5	687.5±5.4	190.3±1.8
Calcium	98±2.6	88.0±3.2	50.6±6.7	26.7±1.8	86.6±2.4	24.6±8.3
Magnesium	24.2±0.11	20.31±0.7	16.1±0.2	15.3±0.8	30.3±0.6	29.6±0.5
Zinc	trace	trace	trace	trace	trace	trace
Iron	trace	trace	trace	trace	trace	trace
Carbonate&Bicorbonate	trace	trace	trace	trace	trace	trace
Organic Carbon	0.35±0.04	0.34±0.01	0.03±0.002	0.03±0.001	0.02±0.001	0.02±0.002
Organic matter	0.81±0.11	0.77±0.03	0.06±0.004	0.06±0.03	0.11±0.006	0.06±0.002

The nitrogen content of the sample between the season showed insignificant variation. The iron, zinc, Carbonate and bicarbonate and the total phosphorus were found to be trace. The potassium level showed significant variation between the season. The organic carbon and the organic matter level showed insignificant variation between the seasons. The analyses revealed that the physico chemical factors showed significant variation between the seasons.

DISCUSSION

Mangroves are woody plants that grow in the tropical and subtropical latitudes along the land sea interface, bays, estuaries, lagoons. Backwaters and in the rivers. The mangroves reach upstream up to the point where the water still remains saline. These plants and their associated organisms constitute the mangrove forest community or the mangal. The mnangal and its associated abiotic community constitute the mangrove ecosystem. Minimum pH was recorded during the summer months could be due to the increased temperature coupled with high salinity.(Tiwari,1990; Xavier *et al*., 1999). Salinity level was recorded maximum during the summer seasons. Similar results were recorded by Padmavathy and Sathyanarayana, (1999), Bhave and Borse (2001). Dissolved Oxygen content of the water body is greatly influenced by temperature, photosynthetic activity and respiration. (Tiwari, 1990). The analyses showed inverse relationship with the tempertature (Olsen and Summerfield, 1997), Goldman and Home, (1983), Bhave and Borse (2001).

Nutrients such as nitrare and inorganic phosphate were abundant during the monsoon due to the monsoonal rainflow of freshwater and land runoff. A decreased nutrient level during summer and postmonsoon due to the prevailing hydrographic and meterological conditions. (Agadi and Untawala, 1978).

Higher salinity would cause a profound impact on the animals such as planktons, fungi, benthyic forms, shrimps, crabs, fishes, etc., which live in and around the mangroves (Kathiresan, 2000: Siva and Sugumaran., 2013).

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