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Data Article

Sediment textural characteristics and elemental distribution in the core sediments, Pullivasal and Kurusadai Island, Gulf of Mannar, Southeast coast of India

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ABSTRACT

Two core samples were collected in order to assess the textual characteristics and elemental distribution of the sediments, from the lagoonal environment of Pullivasal and Kurusadai island, Gulf of Mannar, Southeast coast of India. The distribution of the organic matter and calcium carbonate is chiefly controlled by the coral debris, shell fragments and mangrove litters. The elemental distribution is controlled by natural process and other trace elements are controlled by anthropogenic land based activities.

Specifications Table

Subject area	Sedimentology, Geochemistry
More specific subject area	Sediment geochemistry
Type of data	Table and Figure

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How data was acquired	Grain size analysis, Total digestion and Atomic Absorption Spectrophotometer (Model no - ELICO SL 194)
Data format	Raw data, analyzed
Experimental factors	Sediment core samples were collected from coral islands using PVC pipes
Experimental features	Assess the concentration of elements using AAS and Grain size studies using an electronic sieve shaker
Data source location	Pullivasal and Kurusadai Islands of Gulf of Mannar, Tamil Nadu, India
Data accessibility	Data available within the article

Value of the data

- The depositional environmental condition and natural disaster events can be studied the rough sediment textural analysis.
- The relationship between elemental concentration, calcium carbonate (CaCO3) and organic matter (OM) content is helpful to identify the mode of elemental transport in the coral reef environment.
- The coral rubbles and lithoclastic sediments are explaining the intensity of eolian and marine process during the past.

1. Data

The sampling location was chosen from Pullivasal and Kurusadai Islands of Gulf of Mannar (Fig. 1). Tables 1 and 2 is representing the sediment textural characteristics, $CaCO_3$, Organic matter and elemental distribution of the core sediments of Pullivasal and Kurusadai Islands of Gulf of Mannar. The vertical distribution of the sediment textural characteristics, $CaCO_3$, Organic matter and the elements were plotted in Figs. 2–4.

2. Experimental design, materials and methods

2.1. Sample collections

Two core samples were collected using PVC pipe and the retrieved core samples are transported to Department of Geology, University of Madras and keep the both cores at −5 °C. The total length of the cores is 50 and 40 cm respectively. The sub sample was separated at every 2 cm interval. The coarse grained coral rubbles were removed from a subsample manually.

2.2. Elemental analysis, textural characteristic studies, Determination of Organic matter and calcium carbonate (OM and $CaCO_3$)

The textural characteristics of the sediments were clearly suggested the dominancy of fine fractions in the core sediments. This observation primary due to persistence of calm environment in the lagoon. The core sediments are dominated by sandy clay in Pullivasal Island and sandy silt in Kurusadai Island. Organic matter (OM) was determined by exothermic heating and oxidation with potassium dichromate and concentrated H_2SO_4. The excess amount of dichromate titrated with 0.5 N ferrous ammonium sulfate solution [3]. Calcium carbonate (CaCO3) and trace element analyses were performed as suggested by Loring and Rantala [2]. The maximum concentration of calcium carbonate in the lower part of the core may be due to the presence of small coral rubbles and coral sand. The same trend was also observed in organic matter content. The enrichment of organic matter in the down core region is chiefly derived from mangrove litters and decomposition sediment associated