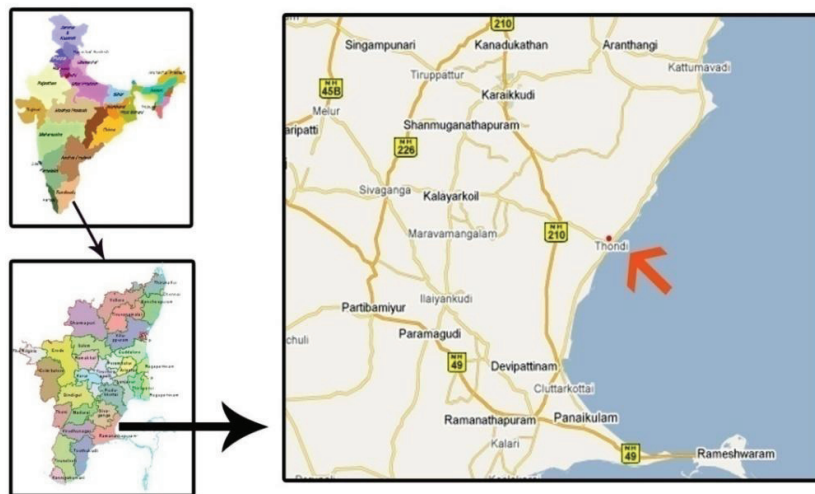


4.0. MATERIALS AND METHODS

4.1. Description of the study area

The present study collected semi decomposed sea grass from Thondi Coast along Palk Strait of south east coast of India Tamil Nadu (Fig. 1). The study area lies in the latitude of $9^{\circ} 44' 01.78''$ N and longitude of $79^{\circ} 01' 00.98''$ E. The temperature usually varies from 25°C to 28°C and salinity from 33 to 35 ppt. The average rainfall in this region 138 mm. Thondi region considered to be main landing centre for fin fishes and shell fishes in Indian coast. Thondi area is rich in seagrass biodiversity and hence it was selected for the present study. Thondi coast has a very minimal wave action. Turbidity of the seawater is moderately low and also rich in nutrients hence, it serves as a treasure house for valuable marine resources like sea grasses, seaweeds and invertebrates like coelenterates, echinoderms and shell fishes. The major occupation of the people is fishing.

Fig.1. Map showing the study area of Thondi region



4.2. Collection of seagrass biowastes

Semi decomposed mixed seagrass species of *Cymodocea serrulata* and *Syringodium isoetifolium* were collected from the sea shore area along the Palk Strait of Thondi region. Then they were stored in plastic tubs.

4.2.1. Taxonomic Position

Cymodocea serrulata

Kingdom : Plantae
Division : Mangoliophyta
Class : Liliopsida
Order : Alismatales
Family : Potamogetonaceae
Genus : *Cymodocea*
Species : *serrulata*



Syringodium isoetifolium

Kingdom : Plantae
Division : Mangoliophyta
Class : Liliopsida
Order : Alismatales
Family : Cymodoceaceae
Genus : *Syringodium*
Species : *isoetifolium*



4.2.2. Collection of earth worms (Bhattacharjee and Chaudhuri, 2002)


Matured saline tolerant earth worms were collected aseptically in the sterile covers (zip lap) from the Thondi sea shore from the decomposing seagrass accumulated in the shore during low tide. Agricultural earthworms were collected from agricultural lands near Thondi area. Both the collected earth worms were transferred separately in to the plastic tubs (60cm × 50cm × 25cm) containing semi decomposed sea grass.

4.2.3. Identification of earthworm

The matured earthworms were collected from seagrass compost. These specimens in this study were identified following the taxonomic key in Blakcmore (2006). The adult, clitellate earthworms were killed in 30% ethanol and preserved in 70% ethanol. Fragments of the muscular body wall from behind the clitellar region were cut for analysis, after removing internal organs. As a proof of taxonomic identification, the anterior part of all analyzed individuals is kept in 96% ethanol. Further, species level identification of earthworm was carried out by standard methodology and authenticated by Dr. K. Vijayalakshmi, Professor (retired), Centre for Environmental Sciences, Manonmaniam Sundaranar University, Alwarkurichi.


Taxonomic Position of Saline tolerant Earthworm

<i>Pontodrilus litoralis</i>	
Phylum	:Annelida
Subphylum	:Clitellata
Class	:Oligochaeta
Family	:Megascolecidae
Genus	: <i>Pontodrilus</i>
Species	: <i>litoralis</i>



Taxonomic Position of Agriculture Earthworm

<i>Megascolex mauritii</i>	
Phylum	:Annelida
Subphylum	:Clitellata
Class	:Oligochaeta
Family	:Megascolecidae
Genus	: <i>Megascolex</i>
Species	: <i>mauritii</i>



4.2.4. Preparation of seagrass compost

Semi decomposed seagrass kept in the tubs were inoculated with 10 numbers of both agricultural and saline tolerant earthworm species. It was kept under the shadow condition and the fresh water was sprayed daily for thrice for three months. After that, the compost was ready for crop treatment.

4.2.5. Treatments

Control – No seagrass compost –only garden soil

Treatment 1 (T1) – Saline tolerant seagrass compost

Treatment 2 (T2) - Agriculture seagrass compost

4.2.6. Seagrass compost induced growth on crop plants

To study the effect of seagrass compost on the growth of coastal rice crop, an experiment was conducted. Certified seeds of paddy (IR36) and tomato plant seed were procured from Department of Agriculture, Ramanathapuram, Tamil Nadu, India. The seeds were surface sterilized with 0.1% HgCl₂ for 5 minutes and washed thrice with sterile distilled water. The pre-sterilised seeds were separately spreaded on to the different treatments of with or without seagrass compost and moisture daily with sterile distilled water. Five replicates of each treatment were maintained for each treatment. The seeds without seagrass compost treatment served as control. After 60 days, the growth and yield of rice and yield of tomato plants were recorded.

The plant growth characteristics *viz.*, average root length, average shoot length, number of roots, root and shoot biomass were analyzed. The pigments such as total chlorophyll, chlorophyll-a, chlorophyll-b and Carotenoids and the biochemical constituents *viz.* carbohydrate, protein, amino acids were estimated as previously mentioned standard methods.

Estimation of pigments was done by following the technique of Hiscox and Israelstam (1979). The biochemical constituents *viz.* carbohydrate, protein and amino acid were estimated by phenol, H₂SO₄ method (Dubois *et al.*, 1956), Folin-phenol reagent method (Lowry *et al.*, 1951), ninhydrin method (Moore and Stein, 1948) respectively. The results were statistically analysed for significance. The results are shown in tables mainly for statistically significant values among the treatments.