2. Materials and Methods

2.1 Study area

Pondicherry mangroves, the study area lies within the boundaries of latitudes 11°46'03" to 11°53'40" North and longitudes 79°49'45" to 79°48'00" East. Mangrove exists as fringing vegetation over 168 ha distributed along the sides of Ariyankuppam estuary, it is seasonally bar-built and semi diurnal type that flows eastwards emptying in to the Bay of Bengal at Veerampattinam on southeast coast of India, carrying wastes from adjacent agriculture lands and industries in addition to domestic municipal and distillery effluents [21]. Pondicherry mangroves are a productive region of east coast represents rich mangrove diversity and harbors a plethora of organisms. The present study was carried out in two different sites namely 1. Non - mangrove site 2. Mangrove site.

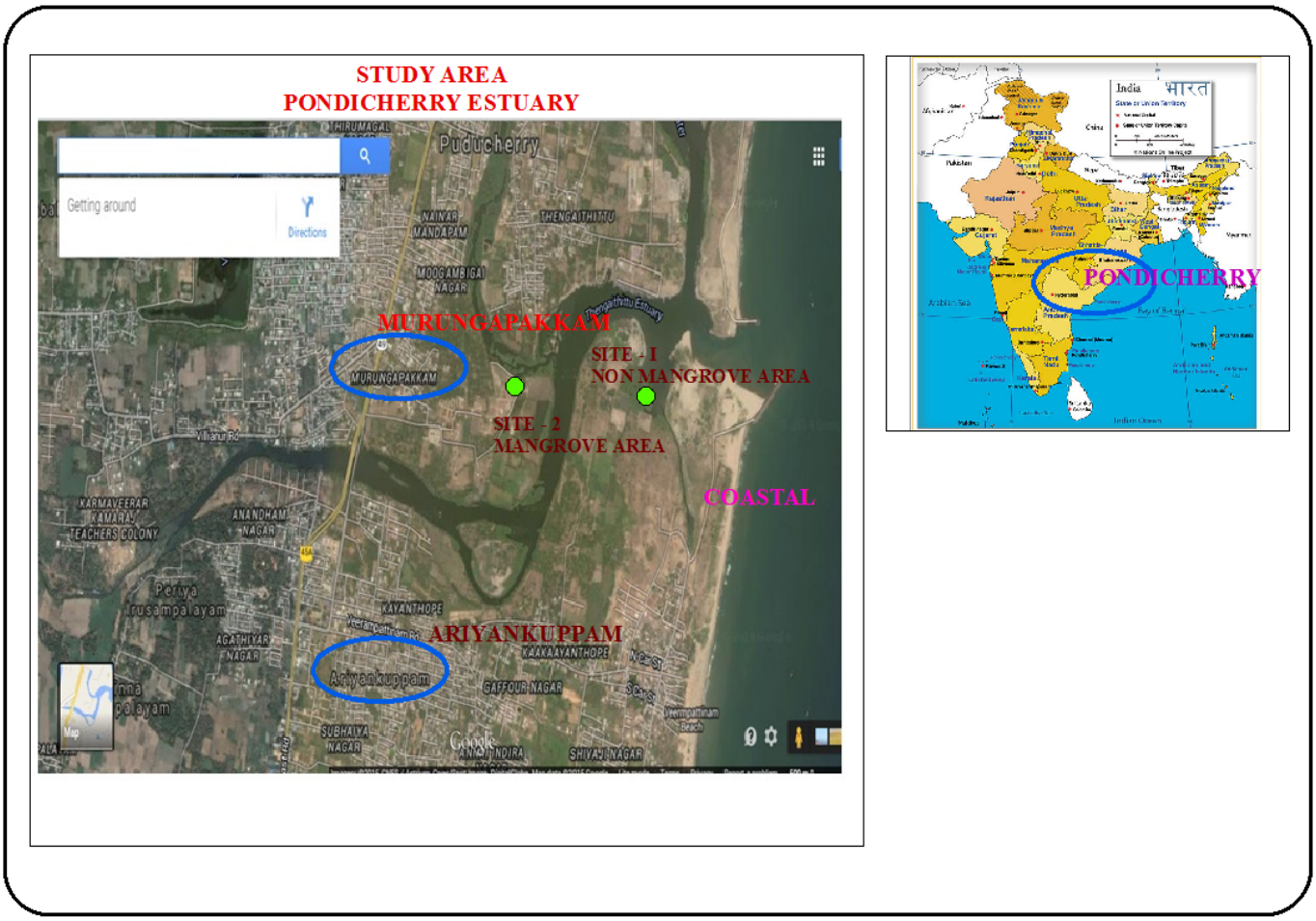

Fig 1: Showing the study sites in Pondicherry Mangrove environments

Natural mangrove habitat is observed at Murungapakkam area *Avicennia marina* is the dominant mangrove species observed in this region. The local people residing near the mangrove site use this region for different purposes like fisheries, mangrove seed collection, fodder for live stock, mudskipper and crab collection etc.

The two study sites were searched randomly for crab collection. Hand picking method was adopted for the collection of crab while for burrowing crabs, diluted formalin was poured in the burrow and when the crab comes out of burrow it was collected. All the collected specimens were preserved in 10% formalin for further identification purpose. The preserved specimens were identified up to the species level using different identification keys available in the published literature [3, 22, 26, 13].

3. Results

In the present study totally 19 species of brachyuran crabs belonging to 13 genera and 8 families were recorded. Crabs belonging to family Portunidae (4 species) followed by Ocypodidae, Grapsidae, Calappidae (3 species), Sesarmidae, Macrophthalmus (2 species), Varunidae and Gecarcinidae (1 species). In this study 08 species were recorded in the both study sites (*U.triangularis, U. annulipes, O. ceratophthalma, S. serrata, S. tranquebarica, M. messor, M. dilates* and *C. carnifex*) which make them the common species in this study areas. Family wise species distribution in mangrove site, maximum numbers of crabs were reported from families like ocypodidae (3 species), Calappidae (1 species), Portunidae (3 species), Varunidae (1 species), Grapsidae (3 species), Sesarmidae (2 species), Macrophthalmus (2 species) and Gecarcinidae (1 species) which are typically found in mangrove habitat. Totally 11 different species 8 genera belonging to 7 families were recorded from non mangrove site near neritic zone of Ariyankuppam estuary. In this study Moon crabs *Calappa clypeta* first time reported in our mangrove study sites.

Among the mangrove zone seasarmid crab distributions are dominant. The major outcome of the study was maximum species diversity was found at natural mangrove site with 16 species, followed by least diversity was recorded at non-mangrove site with 11 species. seasarmid crabs is the dominant representative among all and next to that *Uca* species takes place.

Table 1: List of Brachyuran crabs recorded in Pondicherry Mangrove

Species	Non Mangrove site	Mangrove site
Family: Ocypodidae		
Uca triangularis	+	+
Uca annulipes	+	+
Ocypode ceratophthalma	+	+
Family: Calappidae		
Calappa lophos	+	-
Calappa bilineata	+	-
Matuta planipes	-	+
Family: Portunidae		
Scylla serrata	+	+
Scylla tranquebarica	+	+
Portunus pelagicus	-	+
Family: Varunidae		
Metaplax indica	-	+
Charybdis feriatus	+	-
Family: Grapsidae		
Grapsus intermedius	-	+
Grapsus albolineatus	-	+
Metapograspus messor	+	+
Family: Sesarmidae		
Sesarma plicatum	-	+
Sesarma brockii	-	+
Family: Macrophthalmus		
Macrophthalmus dilates	+	+
Macrophthalmus depressus	-	+
Family: Gecarcinidae		
Cardisoma carnifex	+	+
Total	**11**	**16**

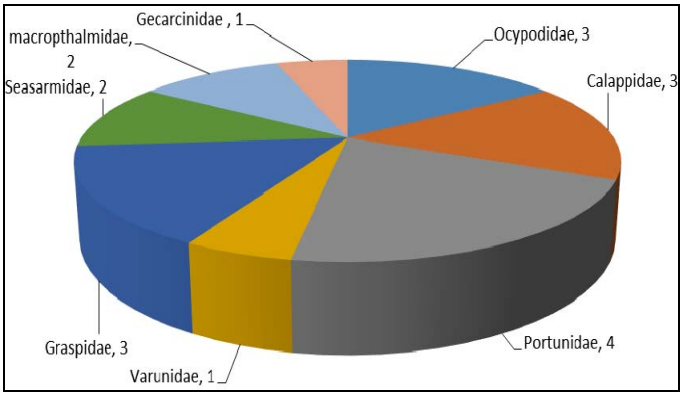

Fig 2: Family wise distribution of Crabs in Pondicherry Mangroves

4. Discussion

This study gave a reference state of the species composition and zonation of the mangrove communities along the Pondicherry coast. Of all the benthic macro fauna inhabiting the mangrove swamps, brachyuran crabs are the most important taxa with regard to the species diversity and total biomass. Crabs depend on directly on mangroves for survival and are adapted to the special sediment condition, tidal fluctuations and varying salinities found in mangroves [4].

In the previous study 22 species (1 callappid, 1 gecarcinid, 9 portunid, 7 ocypodid, and 4 grapsids) of brachyuran crabs were recorded from same study area which has an area of 168 ha only (Satheeshkumar, 2011). 13 species of brachyuran crab (4 species of grapsids and 9 species of ocypodids) in the arid zone mangroves of Gulf Kachchh recorded [19]. Biodiversity studies on crabs in Pichavaram mangroves for the first time has shown that there are 46 species from the five different stations [18]. 38 species of brachyuran crabs in both natural Pichavaram and artificially developed mangroves of Vellar estuary which has an area of 1200 ha (18 species of graspids and 7 species of ocypodids at Pichavaram mangroves; while 8 species of graspids and 3 species of ocypodids at Vellar mangroves) reported by [1]. Chakrobarthy *et al.*, (1994) reported 18 species of brachyuran crabs belonging to 11 genera 4 families from the intertidal belt of prentice in Sundarban mangroves.

Habitat distribution and diversity of crabs were based on the substratum, water level and floral distribution. Pondicherry mangroves were found to be sandy along its vertical, with transect, with patches of mangrove vegetation. Based on the distribution of plants Pondicherry mangroves was divided into *Rhizophora* zone and non mangrove zones. The crabs are distributed in different vegetative zones. Maximum number of crabs was distributed in *Avicennia* zone. *Sesarma plicatum* and *Sesarma brockii* were present along the high water of neap tides and found to be sheltered amidst *Avicennia* marina. This is attributed due to the presence of rich nutrients in the *Avicennia* leaves when compared to other mangrove leaves [16].

The present investigation was made to understand that among all benthic macro fauna inhabiting the mangrove swamps, brachyuran crabs are the most important taxa. In this study Pondicherry is rich in crab biodiversity, maximum number of crab species recorded from station-II mangrove site and minimum number of crabs were recorded from neritic zone in non mangrove site at station-I.

An effective conservation strategy for mangrove needs to be supported by a better understanding of the processes operating within mangrove ecosystems. Pondicherry mangrove regions are valuable for research and the maintenance of the undisturbed area should be a primary objective for the management, since it represents a more constant crab diversity and highest abundance and sustains the protection of rare species.

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