

POPULATION STATUS OF MUDSKIPPER IN MANGROVE AND NON-MANGROVE AREA OF GHOGHA COAST, BHAVNAGAR, GUJARAT, INDIA

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Received : 18.02.17; **Revised** 19.03.17; **Accepted :** 17.04.17**ABSTRACT**

Population studies on three species of Mudskippers have been carried out during 2015-16 from the mangrove and non-mangrove areas of Ghogha coast, Bhavnagar. Ghogha is small coastal town situated on west coast of India, Gulf of Khambhat. *Periophthalmus waltoni*, *Boleophthalmus dussumieri* and *Scartelaos histophorus* reported in the study area. Mangroves play an important role to maintain the population of mudskipper and to prevent the reduction of mud layer. The thickness of mud layer also plays an important role in mangrove and non-mangrove habitat. Highest population density, frequency and abundance of *Boleophthalmus dussumieri*, *Periophthalmus waltoni* and *Scartelaos histophorus* recorded respectively.

Figures : 08

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KEY WORDS : Distribution, Mangroves, Mud reduction, Mudskipper, Population status.

Introduction

Mudskippers belong from subfamily Oxudercinae (tribe Periophthalmini)⁹, within the family Gobiidae (Gobies). Their presence noticed in Atlantic oceans, Arabian Sea, Africa seas and Indo-Pacific region. They found in intertidal mudflats and mangrove swamps during low tide and living amphibious life^{5,9,17,18}.

They include 34 species worldwide out of them nine species recorded from Indian coasts and seven were in Gujarat^{1,7,10,14}. Three mudskippers genus found throughout the Arabian Gulf like *Boleophthalmus*, *Periophthalmus* and *Scartelaos* are endemic to this region^{9,15} had reported three species of mudskippers in the checklist of intertidal fauna of Ghogha coast. Population density, mud erosion and effects of tsunami on the populations of mudskipper from Tamilnadu coast, India¹³.

Mangrove ecosystem is a specialized environment between land and sea in the subtropical and tropical regions⁴. The mangroves are another confounding variable in the simple picture of mudskipper zonation because they provide a considerably increased range of habitats^{2,3} providing shelter, nutrients and breeding ground to the ecologically significant and commercially important mudskippers.

The present study focuses on fewer population attributes like density, abundance and frequency of mudskippers in the mangroves as well as non-mangrove area of the Ghogha coast.

Study area

Ghogha is a small coastal town situated on the mid-western shore of the Gulf of Khambhat, Gujarat, situated at 25 km away from Bhavnagar. Ghogha has about 4 km long shore line, which

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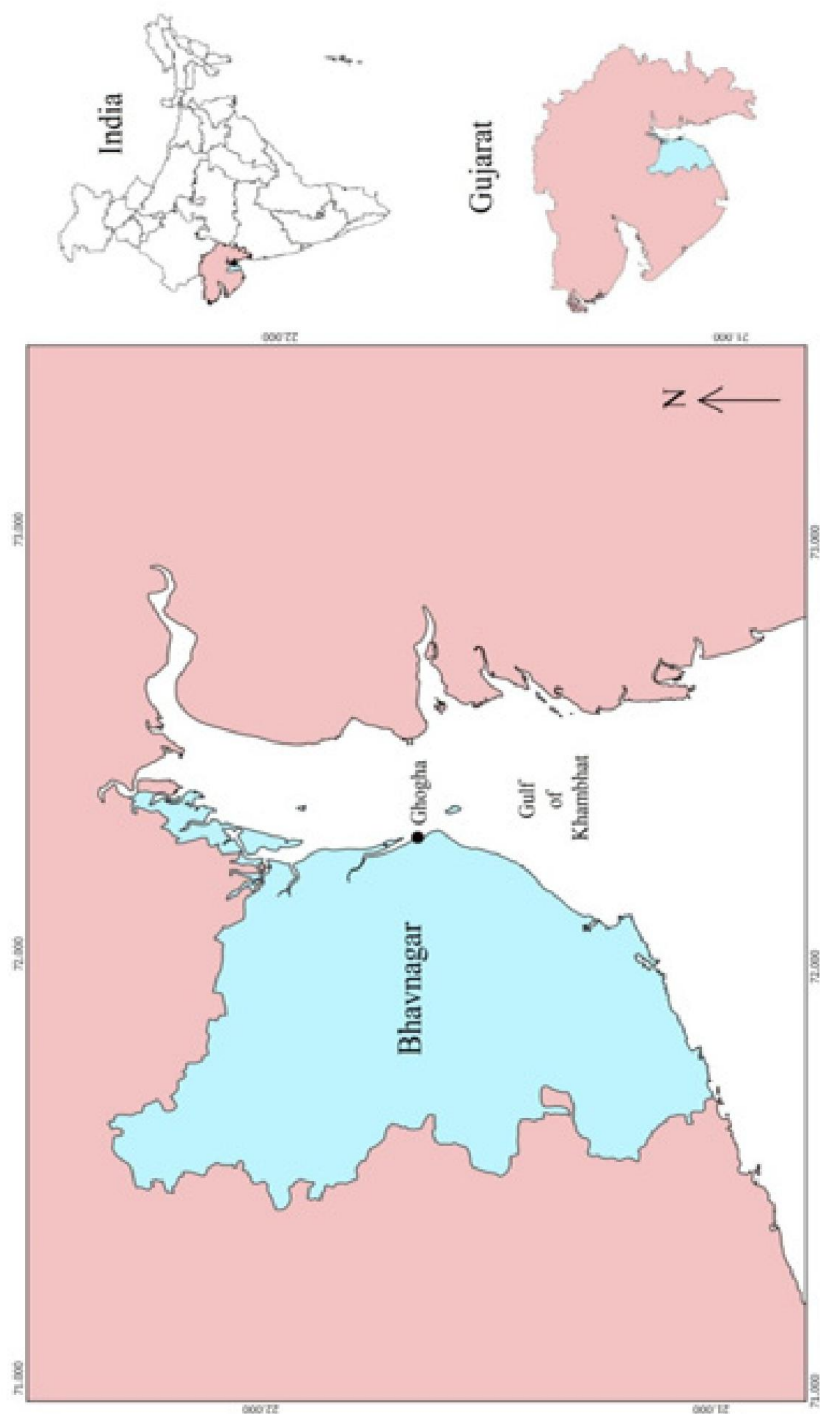


Fig.1 : Map of the sampling site



Fig.2 : (A) Non-mangrove site (B) Mangrove site

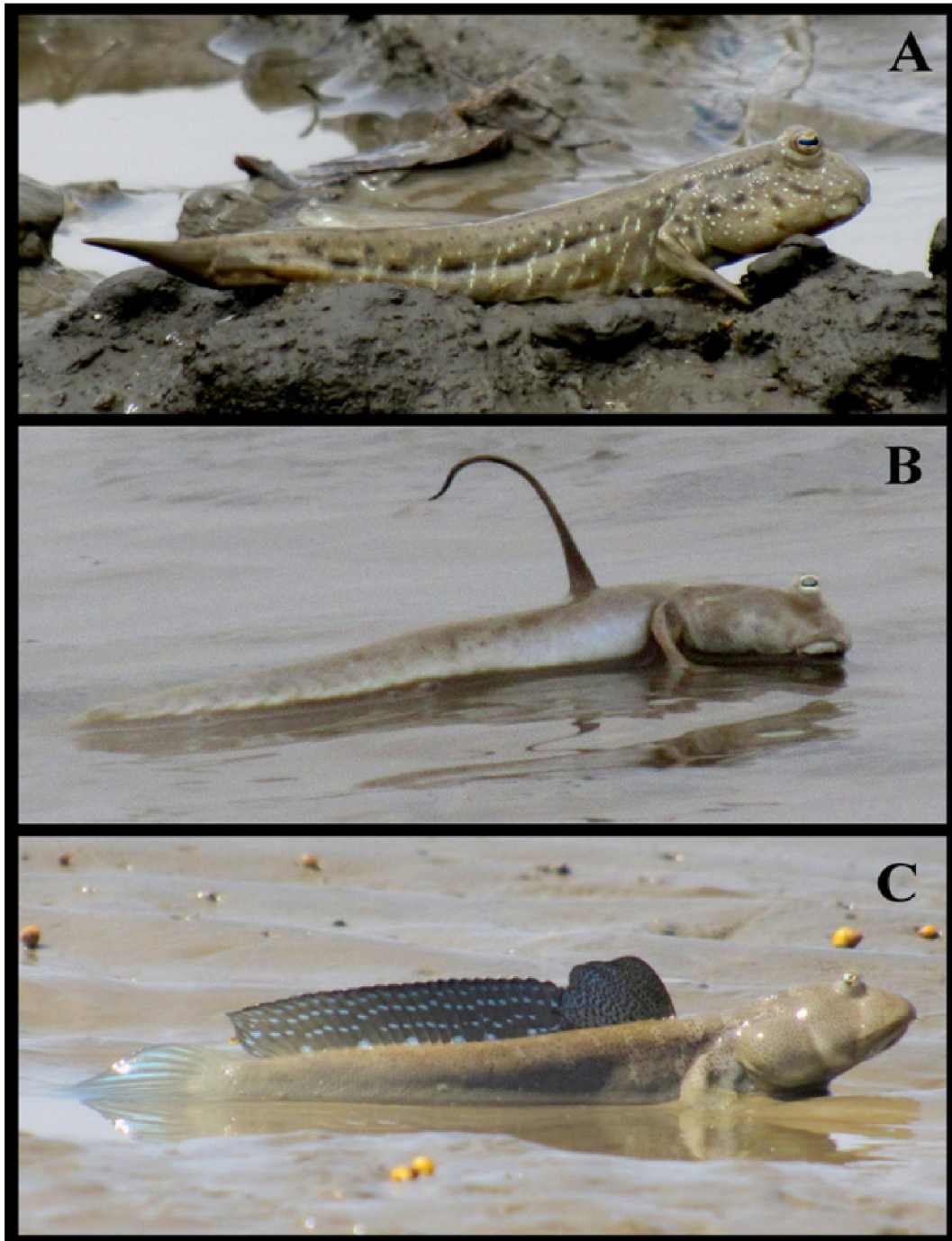


Fig.3 : (A) *P. waltoni* (B) *S. histophorus* (C) *B. dussumeiri*

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comprises unique in characteristics, having supra-tidal zone sandy-muddy with mangrove habitat, while middle intertidal zone is rocky-muddy with mangroves and lower intertidal zone is highly muddy. The principal mangrove species of the coast is *Avicennia marina*.

Materials and Methods

The study was carried out during December 2014 to November 2015. The study area was visited

monthly to know density, abundance and frequency of mudskipper. Quadrates were laid of 1m² size to measure the thickness of mud layer¹³. Number of mudskippers was monitored in each quadrate at mangrove (21°39'49"E 72°17'23"N) and non mangrove site.(21°41'22"E 72°16'58"N) The mudskippers were collected by using hand picking method as well as by purchased from fisherman. The mudskippers identified⁹ and the fish samples preserved in 5% formalin. The thickness of mud

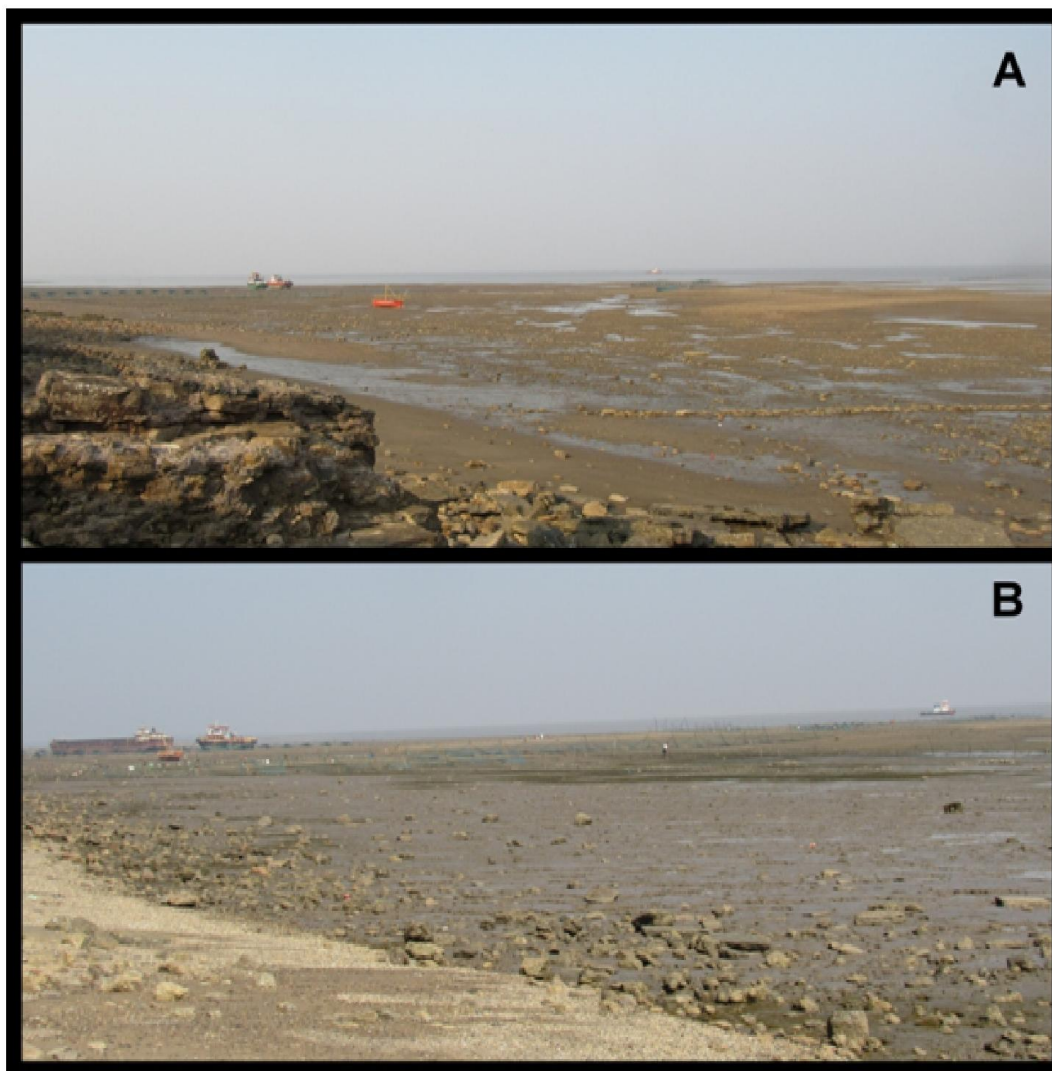


Fig.4 : (A) Mud erosion in monsoon at non mangrove site. (B) Mud layer in winter at non-mangrove site

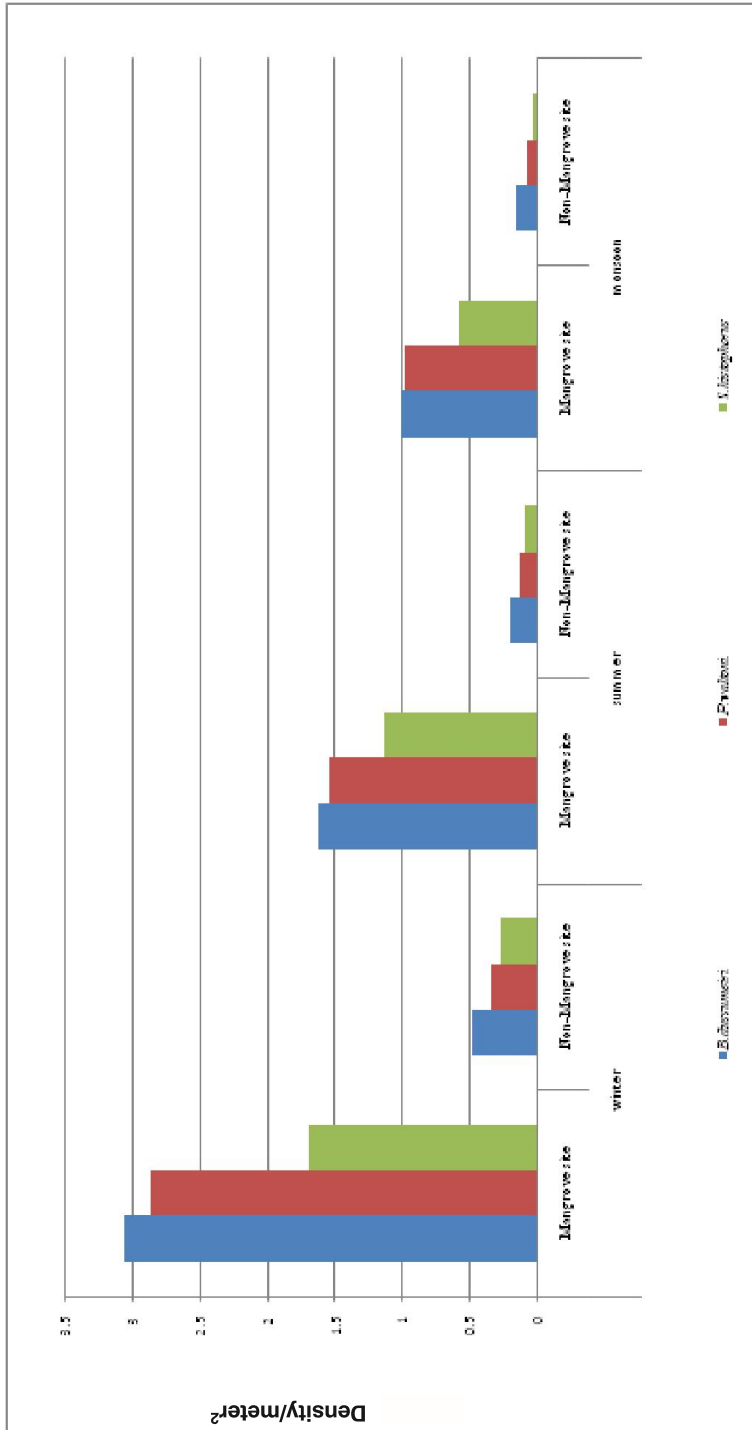


Fig.5 : Density of three species of mudskipper in study site

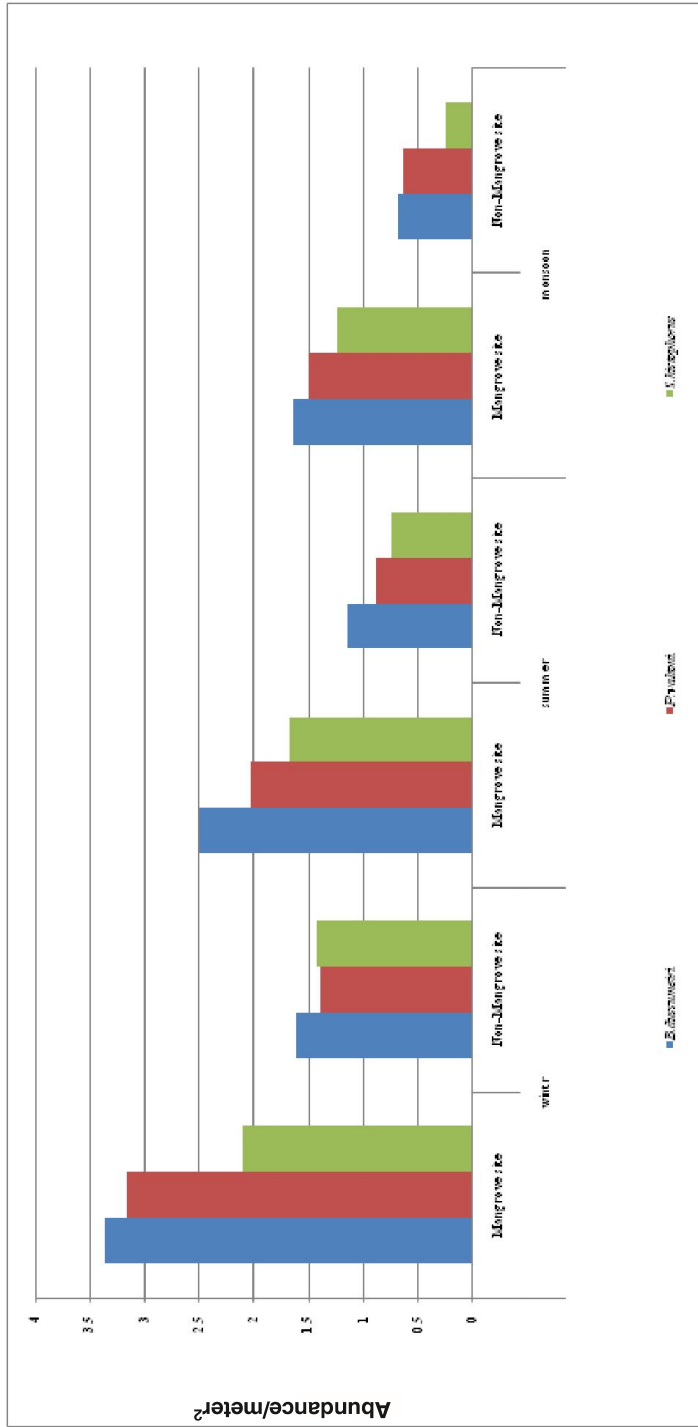


Fig.6 : Abundance of three species of mudskipper in study site



Fig.7 : Frequency (%) of three species of mudskipper in study site

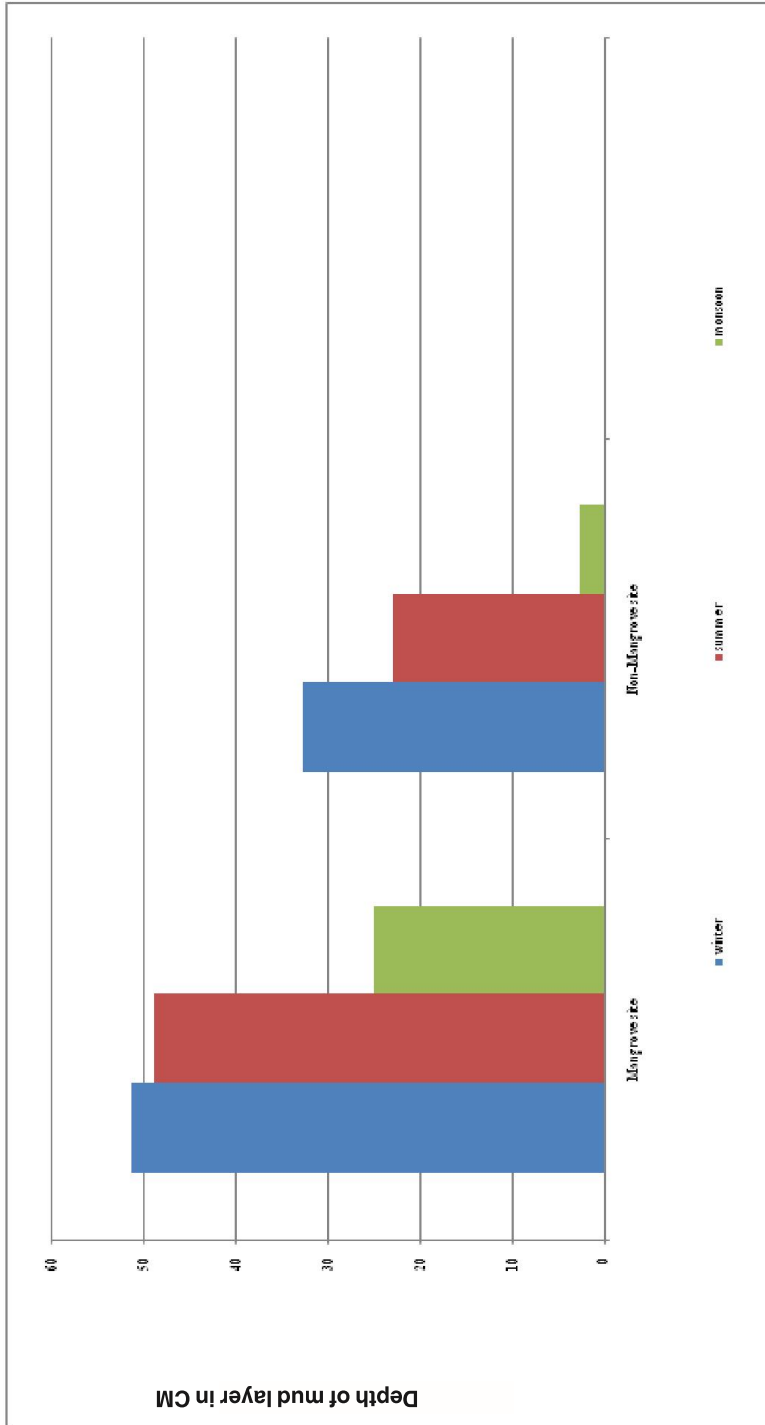


Fig.8 : Thickness of mud layer (CM) in study area

measured in centimetre by using wooden stick and iron rod penetrating in mud.

Results and Discussion

Three species of mudskippers were recorded from mangrove and non-mangrove sites of Ghogha coast namely *B. dussumeiri*, *P. waltoni* and *S. histophorus* (Fig.3). Within study area the highest population density, frequency and abundance of *B. dussumeiri* was recorded following *P. waltoni* and than *S. histophorus*. (Figs. 5, 6 and 7).

The thickness of mud layer varies seasonally (Fig.8). In winter the mud layer was very thick but, in summer and monsoon the thickness of the mud layer decreases due to wave and current action. In the middle of the monsoon, the mud layer in upper intertidal zone was fully eroded and there was no mud available for the mudskippers (Fig. 4). The thickness in mud layer also vary zone wise, higher in supra tidal zone, lower in mid intertidal zone in compare to lower intertidal zone but highest in upper intertidal zone.

Mud was playing an important role in

population dynamics of mudskippers as it provides shelter to mudskippers for burrowing activity. Populations of mudskippers were highest during winter due to higher thickness of mud layer. It was slightly reduced with the decreasing in the mud layer in summer, in monsoon the population of mudskipper was highly decreased due to decrease in thickness of mud in upper and middle intertidal zone. The frequency graph (Fig.6) shows that the distribution of all the three species of mudskipper was found in all seasons of study area. Even though the density of mudskipper high or low. However, in lower intertidal zone some mud patches found, where few mudskippers observed.

Conclusion

Current study gives clear idea about the seasonal population fluctuation of mudskippers in study area. Mud cycle directly affect the mudskipper population by change in its thickness. Mangroves were helpful to mudskipper for its survival. As they provide feeding materials and it prevents somewhat erosion of mud in mangrove areas. So the population of mudskipper was higher in mangroves and lesser in nonmangrove area.

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