Effect of low pH on marine mollusca at Rangbai coast, Gujarat.

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The Study site between N   21° 33' 05 .4′ E 069° 41' 15 .4′ and N 21° 35' 57 .7′ E 069° 41' 26 .6′ observed. The present study investigates Effect of Low pH on marine mollusca, it was observed intertidal zone at Rangbai coast, Gujarat. During study period August 2014 to January 2015, I was observed due to acidic pH the Molluscan diversity directly affected. in Rangbai area is During January month Low pH occur, therefore it was decreased the Diversity of mollusca.

[**Key words**: Rangbai coast, Gujarat, Low pH, Diversity of mollusca]

Introduction

Marine ecosystem particularly the Intertidal zone is one of the most dynamic zones that are the interface between sea and terrestrial environment. Half of the carbon dioxide from the anthropogenic sources have been dumped into the oceans so far. based on various researchers it has been estimated that the pH of the surface ocean has decreased by 0.1 units since industrial revolution which is estimated to be a 30% increase in the hydrogen ions of the surfaces waters, a phenomenon termed as an ocean acidification[1]. The pH range of oceanic waters is 7.5 to 8.4[2] .Temperature, pH, CO_2, and calcium carbonate saturation are among the most important environmental factors controlling the distribution, physiological performance, morphology and behavior of Marine invertebrates[3]. At lower pH, the organism's ability to maintain its salt balance is affected[4]. Studies have shown that decreases in the diversity of phytoplankton, zooplankton and fish have occurred in recently acidified freshwater systems, and critical low pH levels causing significant loss in species have been established for various types of organisms[5]. Ocean acidification is a major threat to calcifying larvae because it decreases availability of the carbonate ions required for skeletogenesis and also exerts a direct pH effect on physiology. Marine invertebrate propagules live in a multistressor world and climate change stressors are adding to the mix. Ocean pH, $pCO2$ and $CaCO 3$ covary and will change simultaneously with temperature, challenging our ability to predict future outcomes for marine biota[6].

Shelled marine molluscs are recognized as key species at the ecosystem level, as they have the potential to impact both community structure and ecosystem functioning. the natural variability of pH and the interactions of changes in the carbonate chemistry with changes in other environmental stressors such as increased temperature and changing salinity, the effects of species interactions, as well as the capacity of the organisms to acclimate and/or adapt to changing environmental conditions are poorly described[7]

Material and Method

The present investigation was carried out on a rocky and sandy intertidal belt at Rangbai coast, Gujarat, India. Rangbai is situated on the west coast of India. The study site Rangbai is near

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around 14 km away distance from Porbandar. Before use, pH meter carefully checked and washed. The pH was measured immediately after collection of the water sample with the help of the portable digital pH meter. pH is the scale of acidity and alkalinity which defines the medium of samples. Portable pH meter was calibrated using standard pH buffer. While study observed that while pH is low the Molluscan diversity is directly decreased. This result was directly observed from study site and pH reading also observed different site and therefore the during January month the Molluscan species is very low compared with another month. the animals checklist was prepared throughout books and manuals

Results and Discussion

The coastal stretches of Gujarat have several industries, which are based on salt as raw material. The saltpan activity not only provides the livelihood for a large number of unskilled workers but also provides the raw material for several such chemical industries.

The present study was conducted to know the low pH is affected by Marine Molluscan diversity from Rangbai coast. We have tried to carefully observe seasonal variation. Mainly during study observed that in December month the total number of Molluscan species is 50 while January month the number of Molluscan species is direct 28.from August to December pH was not shown any significant variation, while in January month pH was 4.3.average sea water pH is 7 to 8 neither acidic nor basic. For molluscan development, acidic sea water is not suitable for molluscan growth and development. On study site in January month, low pH was maybe because of local communities or may be industries influences. It is may be affected by the local community or may be Industrial influences. The rangbai place is one of pilgrims place in Porbandar. January month rapidly decreased pH and number of species. on the rangbai coast, sufficient amount of food availability observed. Here marine algae are sufficient amount found. in fact, high quality of algal diversity is observed. August month pH was a normal still number of species was low because of in Gujarat during August month rainy seasons. From August to January number of species was increased in January month number of species rapidly decreased. During study period is August

2014 to January 2015. During the study, site observed that in January month mollusca is highly decline Compare to another month. Due to While checked the pH observed 4.3.The present study site in observed that while pH is low the number of molluscan diversity is rapidly decrease directly.
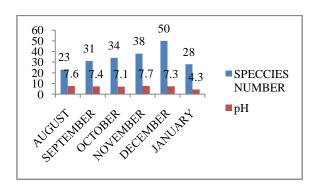

Fig 1. Monthly analysis

Table 1. Monthly species and pH value

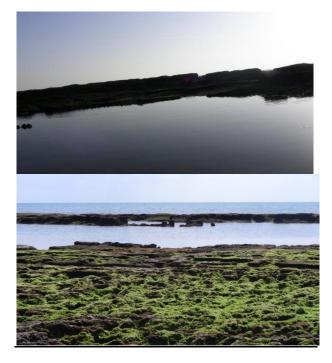| MONTH	SPECCIES NUMBER	pH
AUGUST	24	7.6
SEPTEMBER	31	7.4
OCTOBER	34	7.1
NOVEMBER	38	7.7
DECEMBER	50	7.3
JANUARY	28	4.3

Fig 2. Polluted time study site (January)

Fig 3. without pollution study site

Conclusion

The present study deals with the Affect of Low pH on marine Molluscan diversity in the intertidal area of Rangbai coast of Gujarat. The present investigation was also intended to study the human intervention and its effect on the natural system. The Low pH of water quality is directly affected by Molluscan diversity. because in December number of species fifty but in January number of species 27. Rangbai is located on the coast of Arabian Sea. Winter season found to be the best for the Molluscan diversity probably because of the availability of food is sufficient amount. August to December molluscan diversity was increased but in January month number of molluscan species was rapidly declined. Due to low pH species was rapidly decreased. so, study shown the direct effect of pH on marine molluscan diversity.

Acknowledgement

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