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Red Ghost Crab Ocypode Macrocera (H. Milne Edwards, 1852) Population Dynamics Changes at Bay of Bengal Coast Line in Response to Construction of Digha Marine Drive and Tajpur Port: EIA Study by Rammohan College

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Abstract: ***On the sand beaches of the Bay of Bengal, from Bichitrapur in Orissa to Mandermani in West Bengal, population dynamics of Ocypode macrocera (H. Milne Edwards, 1852) were investigated. The crabs are found across the coastal areas that face the sea. Bichitrapur, Talsari, Udaipur, New Digha, Mohana, Shankarpur, Tajpur, and Mandermoni were the principal study locations. The infra-littoral sand flats zone is where the Red Ghost Crabs live. The development of the particular stretch of beach and the prevalence of crab burrows are related. Crab activity occurs both during the day and at night. One to three openings towards the sea can be found in each crab burrow. EIA (Environmental Impact Assessment) is an essential study required before onset of any project or for any ongoing project. This EIA study was conducted in 2017, prior to the start of "Marine drive & Tajpur port" construction, and in 2020, following completion of "Marine drive& Tajpur port" by Rammohan College. At the construction areas, it was discovered that the Red Ghost Crab population had substantially decreased. Additionally altered is the burrow distribution pattern. An essential ecological stabilizer of Sea beach is the red ghost crab. Additionally, it was discovered that the sea beach began to erode where the crabs were completely gone.***
Keywords: EIA, Ocypode macrocera, Ecology, population , Digha, Bay of Bengal

I. INTRODUCTION

Ocypode Weber, 1795; a semi-terrestrial crabs are common inhabitants of tropical and sub-tropical sandy beaches (Dahl, 1953; Hedgepeth, 1957), where they occupy obvious burrows (Vannini, 1976; 1980). *Ocypode macrocera* (H. Milne Edwards, 1852) lives in the supralittoral zone along the coast of the Bay of Bengal region. Nandi and Dev Roy (1996) and Haque and Choudhury (2014) conducted studies on the burrowing behaviour of *O. macrocera* from the Sundarbans' coastal zone. In the Digha coastal region, Patral et al. (2017) investigated the distribution of every variety of crab. They discovered that the genus *Ocypode* has three species of crab, with *Ocypode macrocera* (H. Milne Edwards, 1852) falling under the IUCN's DD (Data deficient) classification. They are known as RED GHOST CRAB because; if anyone approaches towards them they disappear inside their burrow promptly.

Each burrow aperture has a diameter that falls into one of the following categories: >30 mm, 31-39 mm, 40-50 mm, 51-59 mm, 60-69 mm, 70-79 mm, or 80-90 mm. Burrow opening diameters are often greater than 30 mm and seaward-facing. Before emerging, the burrow dropped in an awkward manner. Burrows were either helical or J-shaped. Always, at least 1 cm of the burrow's deepest point was above the water line (Haque and Choudhury , 2014).

Crab activity surveys revealed through behavioural observations that they were active both during the day and at night. Regular burrow excavation was noted twice a day after the tide receded. Sand was regularly taken from a burrow, and much of it was then scattered to an area about 1 m away. Crabs were often solitary feeders. Scavenging, predation, and deposit were the three main feeding behaviours (Haque and Choudhury , 2014).

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From Bichitrapur to Mandermani on 2017 and 2020, these authors investigated the shore distribution and population structure of *O. macrocera* (H. Milne Edwards, 1852). EIA (Environmental Impact Assessment) is an essential study required before onset of any project or for any ongoing project. The study was carried out to evaluate the effects of the "Digha Marine drive extended from Talsari to Tajpur" and Tajpur Port at Tajpur & Mandarmani Junction on the environment and the ecosystem. The relative number of crab populations and the distribution of burrow patterns have both been assessed.

II. MATERIALS AND METHODS

Studies were conducted at the sand flats of Bichitrapur, Talsari (Orissa), Udaipur, New Digha, Mohana, Shankarpur, Tajpur and Mandermani facing Bay of Bengal during November 2017 and January 2020. *Ocypode macrocera* was present in high density in the upper littoral sand beds of all the sea facing delta lobes in some sites. The survey area at each study site extends about 60 Ft from supra littoral to infra littoral zone and length wise extends about 160 Ft from West to East. A total number 36 quadrate of 10 X 10 Ft were taken at random to count the burrows number at each site. From supra littoral to infra littoral, the sample sites were divided into six zones: Zone I to Zone VI. Zone I was away from high tide line, dry sandy part and Zone VI was just above high tide line, always wet sandy part of the coastline. All calculations have been done using Microsoft Excel, 2010.

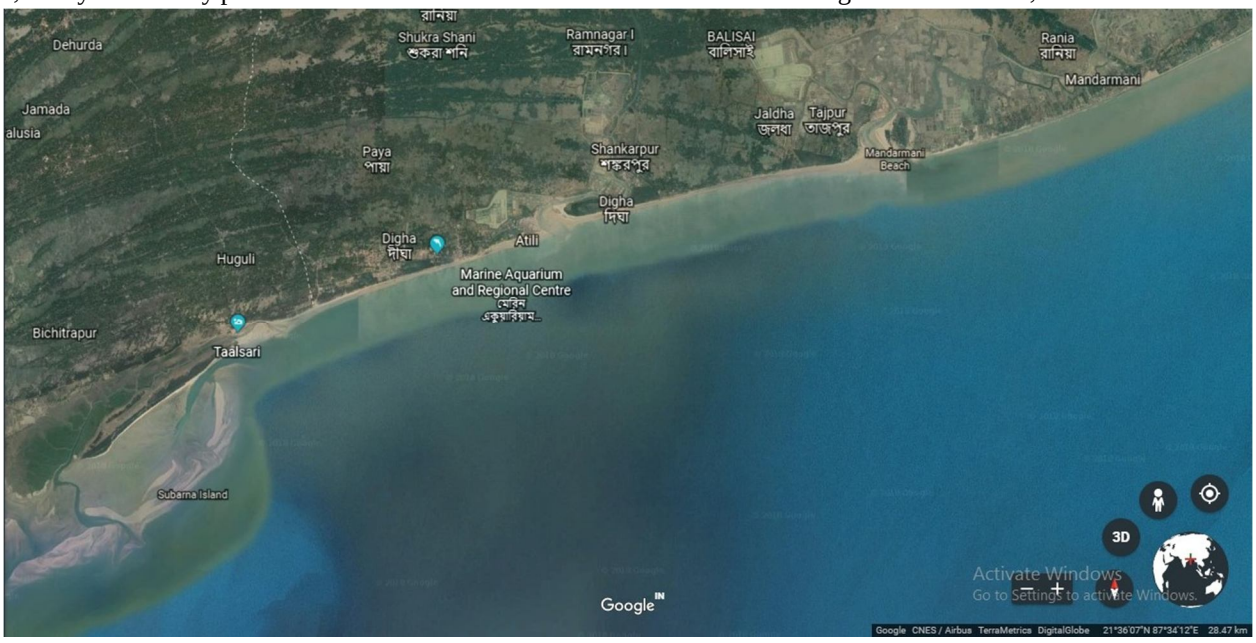


Figure I: Study area, from Bichitrapur at South-West to Mandermoni at North-East

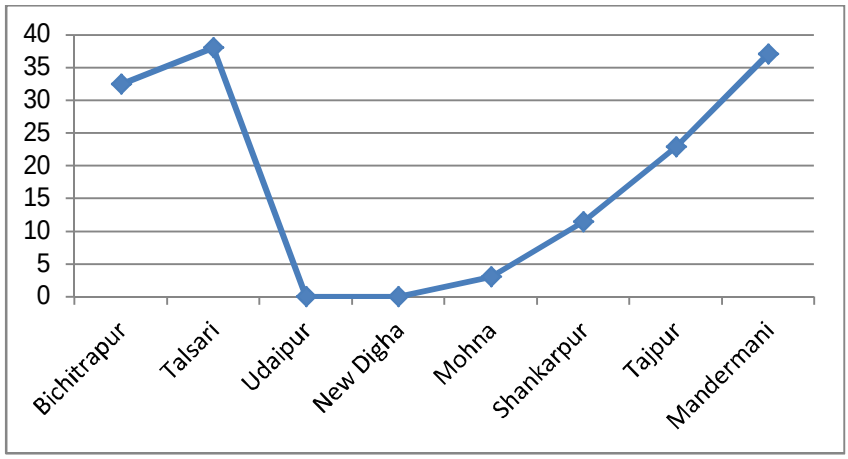
III. RESULT

The result of the survey has been shown in Table I (Mean population at different survey area), Graph I&II (Comparison of distribution at different survey area) and Figure I to XI (Differential distribution of Red Ghost Crab at six different zones of a survey area).

Table I: Crab distribution in different survey area (one hole=one crab)/100Ft^2

Survey Area	Mean ± SD of Crab distribution, November, 2017	Mean ± SD of Crab distribution, January, 2020
Bichitrapur	32.453 ± 1.006	41.25 ± 1.32
Talsari	38.045±0.32	31.416±0.41
Udaipur	0	0
New Digha	0	0
Mohna	3.02777± 0.004	0
Shankarpur	11.43± 0.62	12.429±0.31
Tajpur	22.916± 0.73	12.15±0.61
Mandermani	37.0832 ± 0.03	11.972±0.11

Graph I: Comparative Distribution of Red Ghost Crab at November, 2017



Graph II: Comparative Distribution of Red Ghost Crab at January, 2020

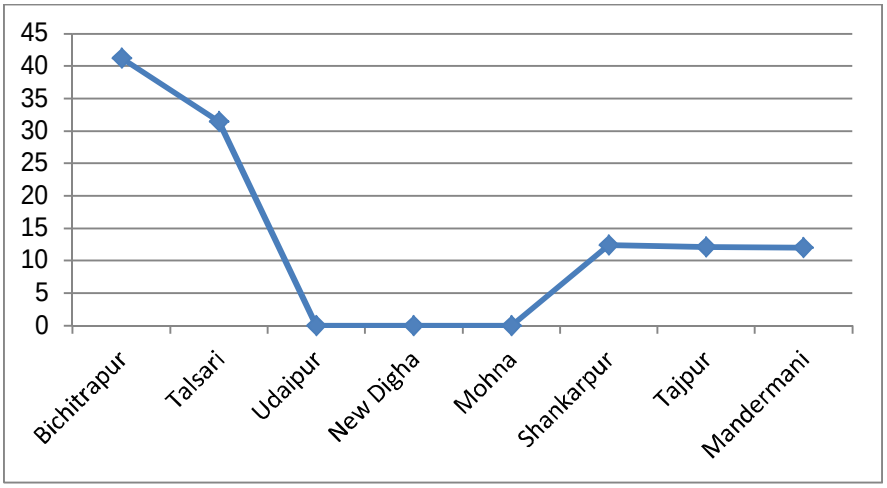


FIGURE 1 TO XI: ZONE WISE DISTRIBUTION OF RED GHOST CRAB AT DIFFERENT SAMPLING SITE

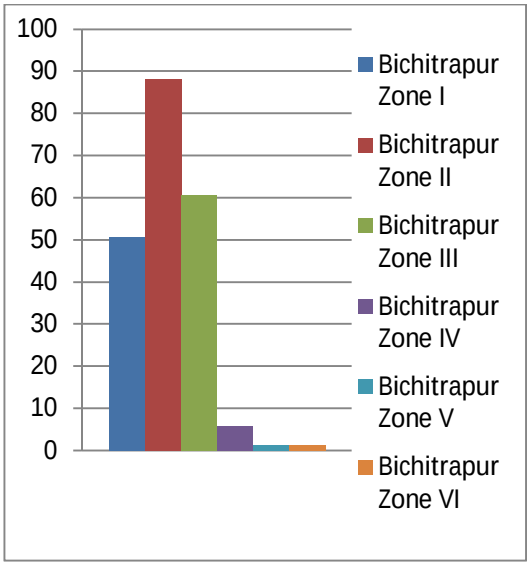


FIG I: 2017

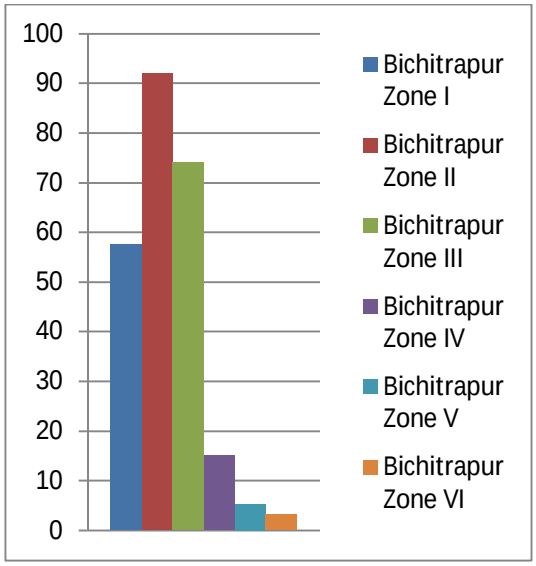


FIG II: 2020

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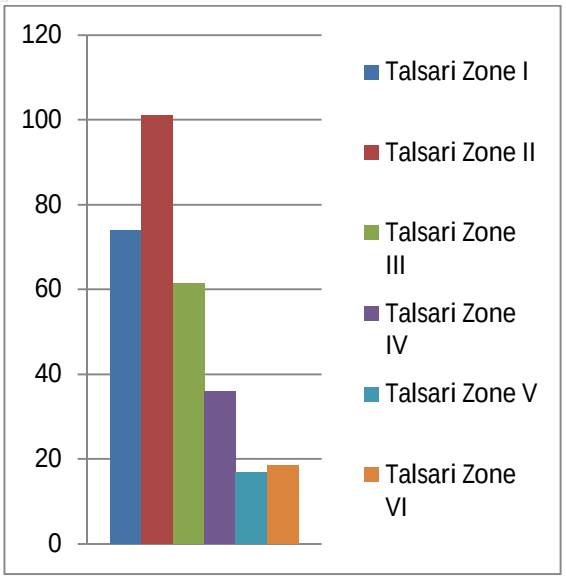


FIG III: 2017

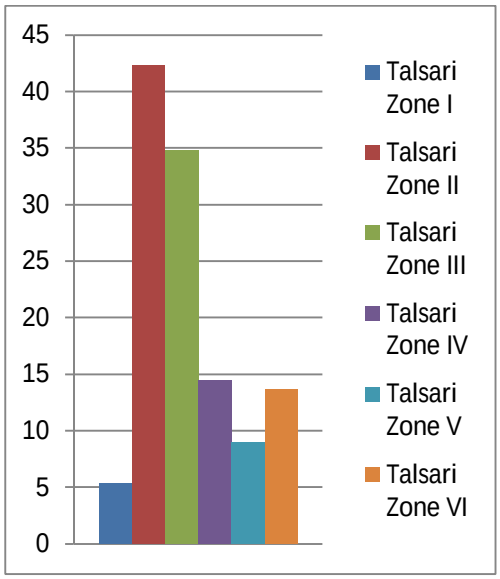


FIG IV: 2020

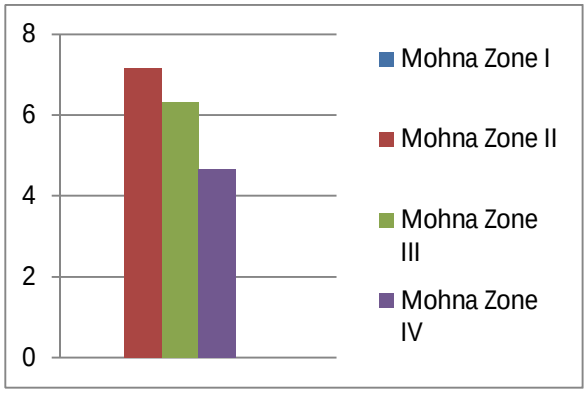


FIG V: 2017

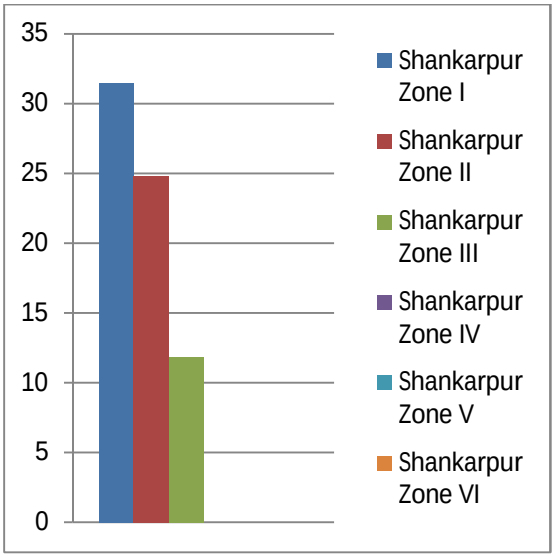


FIG VI: 2017

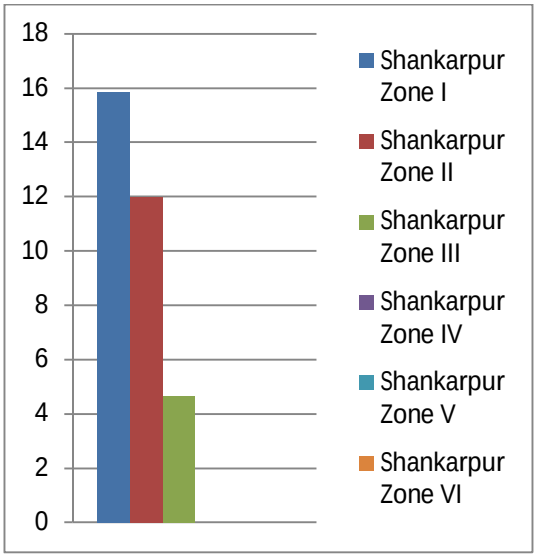


FIG VII: 2020

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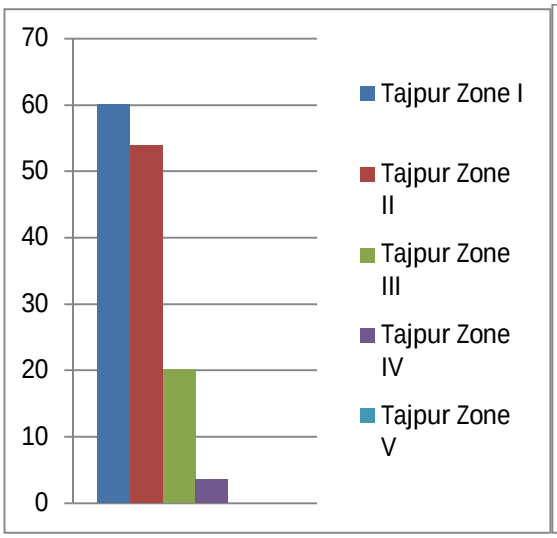


FIG VIII: 2017

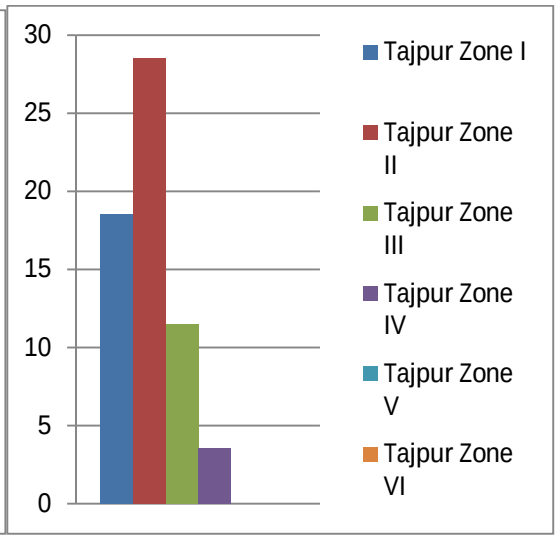


FIG IX: 2020

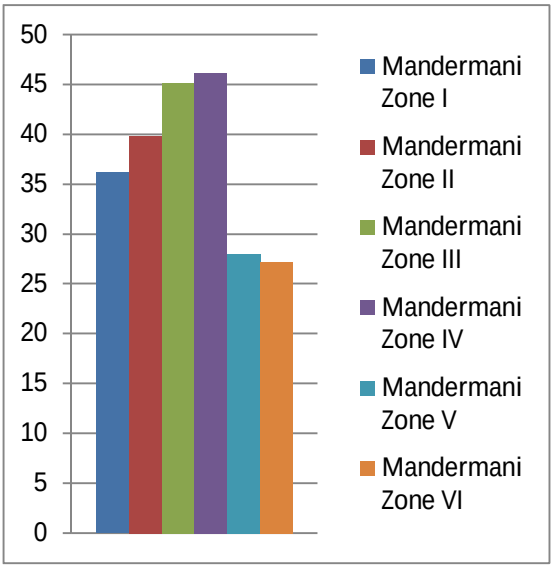


Fig X: 2017

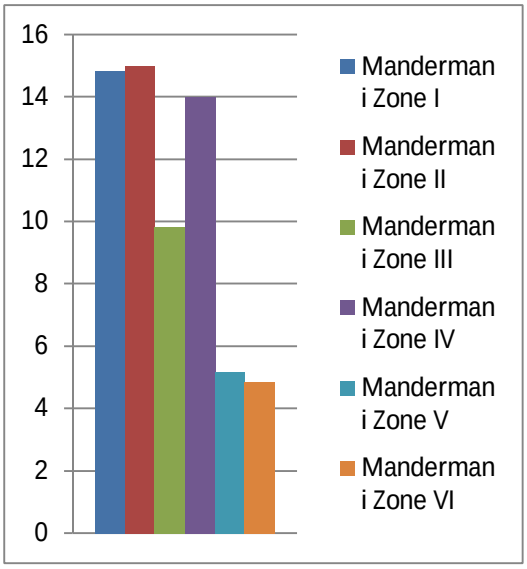


FIG XI: 2020

IV. DISCUSSION

The Red Ghost Crab (Ocypode macrocera) population dynamics showed two different sorts of changes: a change in population size and a change in zonal distribution. In contrast to Talsari, Tajpur, and Mandermani, Bichitrapur had an increase in population density. Ocypode macrocera population in Mohna has been completely wiped out.

Crab density at Zone I of Talsari decreased as a result of disruption from people and vehicles. Because to fishing operations, the crab population in Shankarpur Zones IV, V, and VI, Tajpur Zones V and VI, and Mandermani Zones V and VI either disappeared or reduced.

V. CONCLUSION

The Red Ghost Crab (*Ocypode macrocera*) maintain an important ecological balance at beach ecosystem. Absence of these crab may result sea beach erosion, which is already evident at Shankarpur.

VI. ACKNOWLEDGEMENT

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Red Ghost Crab



Red Ghost Crab Population, Talsari, 2017



Population Survey, Talsari, 2017



Population survey, Talsari, 2020



Digha Marine Drive construction, 2020



Tajpur Watch Tower Construction, 2020



Red Ghost Crab Population, Talsari, 2020



Red Ghost Crab at Tajpur, 2017



Natural Vegetation at Tajpur, 2017



Red Ghost Crab at Tajpur, 2020

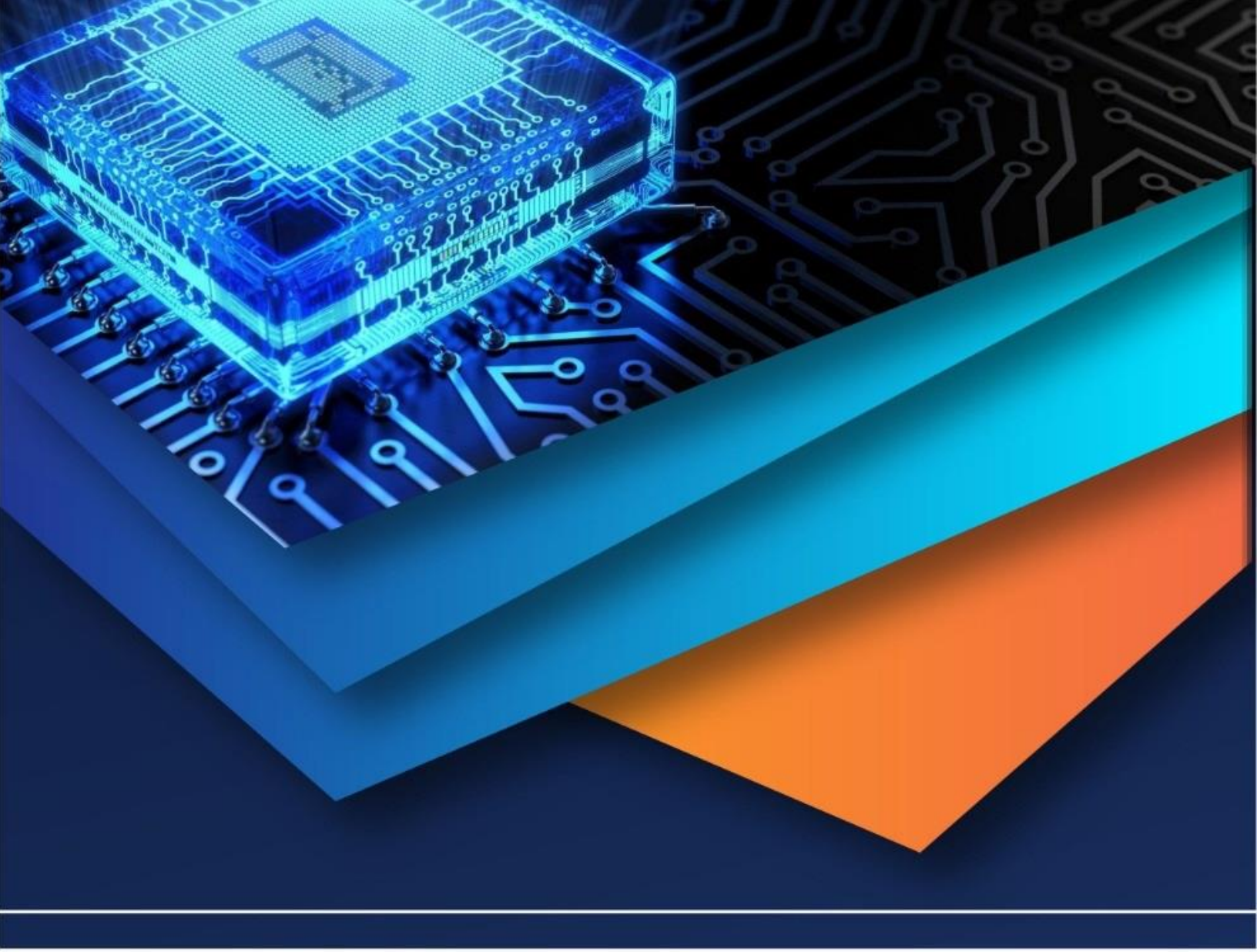


Erosion of Sea beach, Shankarpur, 2020



Red Ghost Crab absent, Mohna, 2020

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