

Anthropogenic disturbances: The red ghost crab (*Ocypode macrocera*) is under threat at Lalkakrar Char, Kuakata, Bangladesh

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Abstract

The red ghost crab (*Ocypode macrocera*) is considered a bioturbator, an environmental architect, a geochemical engineer, a biological engineer, a physical engineer and a climate engineer. *Lalkakrar Char* (Shoal of red crab) is the paradise habitat of red ghost crabs in Bangladesh. In the near past, thousands of crabs came out of the holes and the shoal turned into the red island of scenic beauty during low tide. It is reported that the abundance of red crabs is declining in this area. The study aims to identify the threats to conservation and find out solutions. It was found that motorcycles and mechanized vans for carrying tourists destroy the residing hole of the little mermaid. Consequently, the red crabs are often found injured or dead on the beach. Resultantly, the oxygenation, organic matter decomposition and bioturbation on the beach soil are highly affected. The exotic high water-consuming trees cause scarcity of groundwater, which in turn, leads to the dryness of the shoal gradually. Incremental pollution accelerates eutrophication, turbidity, and hypoxia. As a result, the abundance of dead jellyfish shows an uptrend. The escalated trend of trash and plastic bottles chokes the penetration of the crab community. The study advocated some conservation activities.

Keywords: Red ghost crab, bioturbation, exotic plantation, jellyfish, conservation, little mermaid, eutrophication

Introduction

Lalkakrar Char (Shoal of red crab) is about five km east of *Kuakata* zero point, the second most famous sea beach in Bangladesh. The shoal is characterized by an excellent combination of eye-catching natural beauty, remnants of mangroves, sandy beach, blue sky, a huge expanse of water of the Bay and *Tamarix* vegetation coverage (Rahman 2023a).

The Red ghost crab (*Ocypode macrocera*) is the main attraction of this shoal. In the near past, thousands of crabs come out of the holes on the beach and the area turned into a red island of scenic beauty during low tide. It can change the physical and biochemical properties of the soil including desalinization through bioturbation and can create a congenial habitat for the survival of various organisms and plants in the food cycle (Wang *et al.* 2010; Kristensen *et al.* 2012; Field 1995). By burrowing holes, these crabs provide oxygen underground and can decrease the surface temperature. This bioturbator is considered an environmental architect, geochemical engineer, biological engineer, physical engineer and climate engineer (Dubey *et al.* 2013). It can expose various animal feeds in the sediments, increasing the nutritional quality of the food and changing the distribution of organic matter in the soil (Haque & Choudhury 2014). It accelerates soil particle bonds, removes pollutants from the soil and reduces air pollution.

Huge population pressure and widespread poverty are causing massive degradation of the natural habitats in Bangladesh (Rahman *et al.* 2009, Rahman 2023b, Rahman 2022, Rahman 2021). It is reported that the number of red crabs is disappearing from this shoal. Hence, the study aimed to identify the threats to conservation.

Methodology

Both primary and secondary data were used for this study. The secondary data were collected from Forest Department. A total number of 30 local people were personally interviewed to identify the threats. A focus group discussion was done incorporating the respondents from diverse stakeholders to understand the consequences of the threats. A total of ten key informants were interviewed to find out the solution. Content analysis was done to analyze the data.

Threats to conservation

Mechanized vans and motorcycles

The respondents reported that more than 200 motorcycles and mechanized vans run on the beach for carrying tourists. It destroys the residing hole of the little mermaid. Consequently, the red crabs are often found injured or dead on the beach. The digging of the crab is hampered by such movements and the soil becomes compacted. The oxygenation, organic matter decomposition and bioturbation on the beach soil are highly affected. Resultantly, soil salinity is increased and the food web is affected. The crab cannot help in controlling incremental pollution.

Exotic Plantations

The respondents informed that Forest Department planted exotic Acacia (*Acacia mangium*) and Eucalyptus (*Eucalyptus camaldulensis*) beside the beaches. It was also reported that the exotic high water-consuming trees cause scarcity of groundwater, which leads to dryness gradually. Agricultural biodiversity is impacted by the newly introduced exotic tree species. Rahman (2023c) reported that exotic tree species alter habitat substantially for native flora and fauna with particularly strong negative effects on specialist habitats.

Agricultural and fisheries pollution

The respondents opined that the rampant use of pesticides and chemical fertilizers in the adjacent areas causes severe soil and water pollution. The pollutants originating from the fisheries increase day by day. Incremental pollution accelerates eutrophication, turbidity, and hypoxia.

Over tourism

The crowd of tourists destroy the hole of the crab and causes soil compactness. Consequently, the crabs are downtrodden and declined gradually. The incremental trend of trash and plastic bottles chokes the penetration of the crab community.

Abundance of jellyfish

The respondents reported that the abundance of dead jellyfish on the shoal increases gradually. It may be linked to the uncontrolled use of fertilizer and chemicals on agricultural lands, causing eutrophication, turbidity, and hypoxia.

Lack of awareness

The respondents informed that a large portion of tourists and local people are not aware of conservation values and ecotourism. Insanely they destroy holes and kill crabs.

What to do?

- The shoal should be declared an Ecologically Critical Area (ECA)
- Monitoring of biological resources is essential for appropriate biodiversity management
- Emphasizing a community-based conservation programme
- Logging of exotic tree species followed by indigenous plantation
- Prohibiting the movement of mechanized vans and motorcycles
- Limiting the number of tourists and preparing a guideline for enhancing ecotourism
- Prohibiting the use of chemical fertilizers and pesticide in the adjacent areas
- Controlling all sorts of pollution
- Initiating a conservation programme for the migratory birds
- Promoting public awareness
- Raising funds for the conservation programme
- Constructing a marine drive so that bikes can run at a safe distance

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