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Culture Potential of Mud Crab in Konkan Region of Maharashtra

Jadhav Amit[1*], Gurphale Nikita[2]

[1]M.F.Sc. Scholar, Department of Aquaculture, ICAR-Central Institute of Fisheries Education, Mumbai, India*
[2]M.F.Sc. Scholar, Department of Genetics, ICAR-Central Institute of Fisheries Education, Mumbai, India

Corresponding Email: [1]amitjadhav83080@gmail.com*

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Abstract: ***The Konkan, is a western Indian coastal plain located between the Arabian Sea and the Western Ghats (east). The plain extends roughly 330 miles (530 km) from the Terekhol River between the states of Maharashtra and Goa and the union territory of Daman and Diu in the south to the Daman Ganga River to the north of Mumbai (Bombay). between 45 and 76 kilometers (28 to 47 miles) in width. The adoption of scientific and technical knowledge of ecological and resource potential studies has foreseen the proper utilization of this natural resource for sustainable development. The majority of the farms in the Indian shrimp business have been decimated by infections, primarily WSD. The main issue in shrimp farming is viral infections, which hamper the nation's social and economic development. Socioeconomic estimates of the effects of diseases include issues like losses in production, revenue, employment, investor and customer trust, food shortages, trade disruptions, or firm closure. Due to their attractive traits, such as quick growth, greater size, high fertility, disease resistance, marketability, adaptability to farming techniques, etc., mud crabs are a "candidate species for aquaculture.***

Keywords: Mud Crab, Potential, Konkan Region, Crab Culture, Maharashtra Aquaculture.

1. INTRODUCTION

A general term for water whose salinity falls between fresh and sea water is brackish water, which are transitional zones where such waters mix. The best-known example is an estuary, where a river meets the sea. Estuaries are highly variable environments because the salinity, which ranges from 10 to 32, and over time of day due to tidal cycles, can change significantly over a relatively short distance (for example, high tide bringing saltier marine waters farther up into the estuary). Salinity will decrease at a specific point in the estuary as a result of seasonal increases in freshwater brought on by precipitation or snowmelt.(Rich & Maier, 2015).

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The Maharashtra state has 720 km of coastline and a 1.12 lakh sq. km area which is suitable for marine fishing. Additionally, the State has 3.01 lakh ha and 0.19 lakh ha, respectively, suitable for inland and brackish water fishing. About 80,000 hectares of brackish water are suited for shrimp production. Currently, 12,445 ha of land is suitable for brackish water farming, of which 1,056 ha has developed.(Brackish Water Land Leasing Policy | Department Of Fisheries|Government of Maharashtra,India,).

Sr.	State	Estimated brackish water area (ha)	Area under cultivation (ha)
1	West Bengal	405,000	34,660
2	Orissa	31,600	11,000
3	Andhra Pradesh	150,000	50,000
4	Tamil Nadu	56,000	2,879
5	Pondicherry	800	37
6	Kerala	65,000	14,657
7	Karnataka	8,000	3,500
8	Goa	18,500	650
9	Maharashtra	80,000	716
10	Gujarat	376,000	884
Total		1,190,000	118,983

The adoption of scientific and technical knowledge of ecological and resource potential studies has foreseen the proper utilization of this natural resource for sustainable development.

Konkan Region:

The Konkan, also known as Aparanta, is a western Indian coastal plain located between the Arabian Sea and the Western Ghats (east). The plain extends roughly 330 miles (530 km) from the Terekhol River between the states of Maharashtra and Goa and the union territory of Daman and Diu in the south to the Daman Ganga River to the north of Mumbai (Bombay). between 45 and 76 kilometers (28 to 47 miles) in width.

Seasonal rivers that flow through the area empty the Sahyadri Hills' summit of heavy monsoonal rain. The largely unlevel topography is made up of degraded Ghats remnant mountains that end in a coastline of alternating bays and headlands in the west and low lateritic plateaus in the east. Districts including Mumbai City, Mumbai Suburban, Raigad, Ratnagiri, Sindhudurg, Thane, and Palghar are included in the Konkan Division.

Waves predominate most of the time at the tidal inlets south of 18° N. Estuaries in the north are strongly influenced by tides. The majority of the estuaries along the Konkan coast are oriented in the NW to SE, which suggests a structural control on the streams' tidal sectors. The estuaries and creeks in North Konkan are determined to be coastal plain and bar-built estuaries. A significant factor is the lengthening of the ebb condition, which is reflected in the 1 to 2.5-hour tidal delay period (residence time). The ponding of tidal water in the center of some estuaries, such as those at Kelshi and Anjarle, indicates an imbalance between the length of the estuary and the current tidal range.

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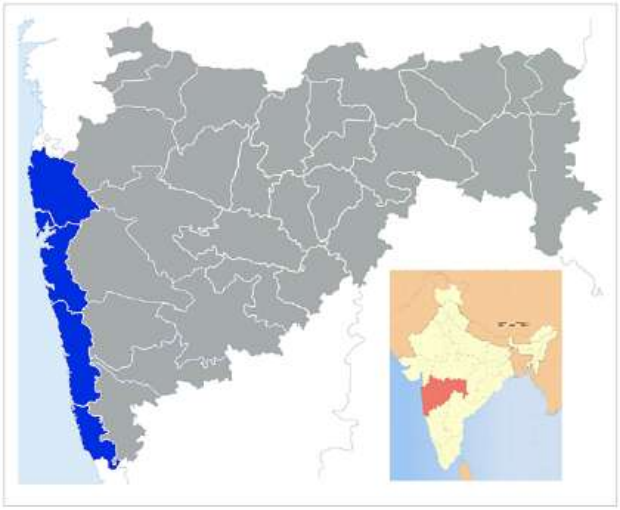
The marsh and swamp borders, high and low tidal flats, sand lenses, sandbanks and islands, and scoured channels are the main sedimentary features of the Konkan streams and estuaries. These are caused by hydrodynamic factors that are site-specific, such as wave action, flow velocities, turbulence, mixing, and scouring. The silty-clayey bars are located in the mid-estuarine sections. These tidal inlets typically range in depth from 1 m near the head to 4 m towards the tidal outlet. In numerous estuaries, including those at Amba, Kundalika, Dabhol, Arjuna, and Karli, tidal water can be detected at a depth of more than 30 meters. The Middle Konkan and South Konkan estuaries are narrow, elongated inlets that have had little human intervention. There are recognized tidal inlets.

During the dry season, a noticeable salt wedge is a defining characteristic. Much of the salinity in the estuaries is diluted by the monsoon's high freshwater flow to a distance of 1-2 km. The lower column of tidal waters still has some salinity, though. After a monsoon, salt wedges quickly re-establish themselves. In the majority of the Konkan estuaries, there are many areas with high salinity and concentrations of suspended material. Only within the estuaries are suspended sediments deposited in significant amounts that enter the estuaries. The mud flats and other places outside the main tidal channel receive a sizable portion of the sediment. Sediment is captured in the deeper areas. These estuaries' sedimentation appears to be influenced by tidal inlet length, tidal range, and the flocculation process.

The mangroves are typically located close to muddy creek banks that are rich in organic matter and have fine silt and clay. The tidal sectors of Ulhas, Amba, Savitri, Mhasala, Kalbadebi, and Rajapur creeks, where the coastlines are free from powerful waves and tidal velocities are not particularly high, can be noted to have dense development of these plants. The vertical tidal range in this area is 2–3 m.



Need of Mud Crab Culture:

The majority of the farms in the Indian shrimp business have been decimated by infections, primarily WSD. The main issue in shrimp farming is viral infections, which hamper the nation's social and economic development. Socioeconomic estimates of the effects of diseases include issues like losses in production, revenue, employment, investor and customer trust, food shortages, trade disruptions, or firm closure. It is not surprising that the

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development of aquaculture led to the spread and emergence of a growing number of novel, undiagnosed diseases because it served as the cornerstone for the anthropogenic alteration of a massive hierarchy. Black tiger shrimp, or Penaeus monodon, was historically the most widely cultivated shrimp species in India. Afterward, in 2009, Litopenaeus vannamei, an American white-leg shrimp, effectively replaced it. Disease issues in India and global shrimp aquaculture have changed as a result of a shift in prevalent species.

The most harmful virus for both species is the White Spot Syndrome Virus (WSSV). The other important infectious agents of P. monodon and L. vannamei include Hepatopancreatic Parvovirus (HPV), Monodon Baculovirus (MBV), and Infectious Hypodermal and Hematopoietic Necrosis Virus (IHHNV). Loose shell syndrome (LSS), a new disease, was already reported in India in late 1998. Monodon slow growth syndrome (MSGS), a more modern disease caused by L. vannamei in India, appears to be a result of the LSNV virus (Tandel et al., 2017).

Genome	Family	Pathogen/Pathogen group	Year of reported in India	OIE listed diseases*
*DNA Viruses				
dsDNA	*Nima. iridae*	WSSV – genus *Whi povi us*	1 94	Yes
dsDNA	*Bacuvoviridae*	MBV – an occluded enteric Baculovirus	1993	No
ssDNA	*Parvoviridae*	IHHNV – a systemic Parvovirus	1998	Yes
		HPV – enteric parvoviruses	2002	No
RNA Virus				
ssRNA	*Barnaviridae*	LSNV – Luteovirus like (unclassified)	2007	No

Mud Crabs:

Indian estuaries and mangroves are habitats for the economically significant crab species Scylla serrata, sometimes known as the Mud crab, green crab, or mangrove crab *-. One of the most highly prized species of crustaceans that live in estuaries, tidal rivers, and creeks. A prospective species for brackish water pond culture.

Mud crabs were once considered a minor species to cultivated finfish or crustaceans. The mud crab has been viewed as a nuisance in ponds despite being designed as a fishpond crop because it burrows through dikes and causes damage and leaks.

Due to their attractive traits, such as quick growth, greater size, high fertility, disease resistance, marketability, adaptability to farming techniques, etc., mud crabs are a "candidate species for aquaculture."

Mud crab farming has established effective since the market is promising and it is profitable. Considering the year-round availability of mud crab juveniles in the habitat and recent advancements in hatchery technology, there is a good chance that the commercial production of mud crabs might be a successful industry.

Due to its high demand/price, rich flesh content, and quick growth rates in captivity, this species has generated a lot of interest in aquaculture. It is in great demand on the global market, especially in South East Asian nations, making it a possible candidate species for commercial-scale aquaculture. One of the most delicious varieties of crab is this seafood delicacy. This is marketed primarily in live markets abroad and is accessible everywhere. This species is heavily exploited throughout India's coastal region. Mud crab farming began in India

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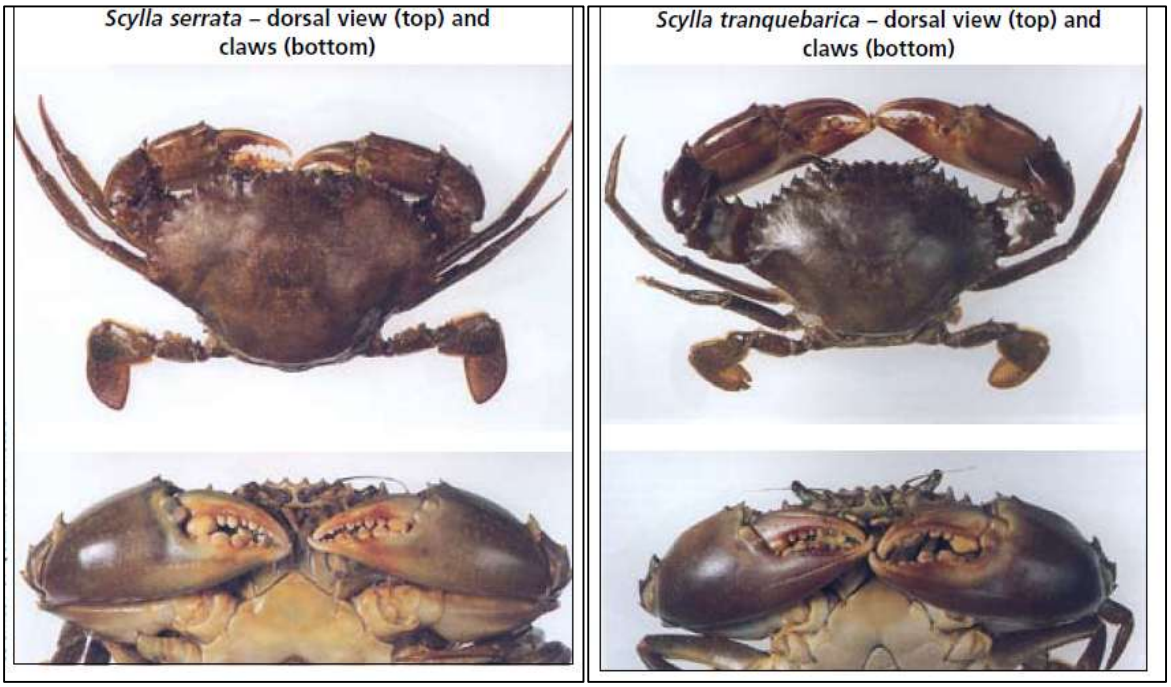
in the early 1980s, and today crab culture is expanding quickly in the states of Andhra Pradesh, Kerala, West Bengal, and Odisha. (Mangrove Crab (Mud Crab) – MPEDA). Therefore, the number, quality, and management of available resources are crucial to the long-term viability and economic success of coastal aquaculture. The technique for mud crab culture and the system of culture that will be used are fully dependent on the site parameters.

Larger species - Scylla tranquebarica

- Polygonal markings on walking and swimming legs
- 2 prominent sharp spines on the outer margin of wrist of chelipeds

Smaller - Scylla serrata:

-No polygonal markings on legs
-1 spine on the outer margin of wrist of chelipeds



Potential Positive impacts

- The most marginal of the coastal saline soils will be brought into productive use.
- The most economically distressed portion of the coastal population (i.e., fishermen) will be offered an alternative economic activity.
- There will be reduced pressure on the coastal fisheries, forests and other natural resources.
- Additional employment opportunities will be created.
- Ancillary activities (e.g., processing, marketing, production and sale of feed etc.) will create additional employment opportunities.
- An activity will be developed that will serve as an "indicator industry" for the general health of coastal waters.

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- Rehabilitation of fisheries.
- Use of abandoned shrimp ponds for crab culture.
- Possible to supply prescribed product (e.g., size, sex, maturity stages, soft shelled crabs) specifically catering to consumer demand.

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