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Feeding habit of Mystus gulio (Long Whiskers Catfish) from Ulhas River Estuary, Thane district, Maharashtra

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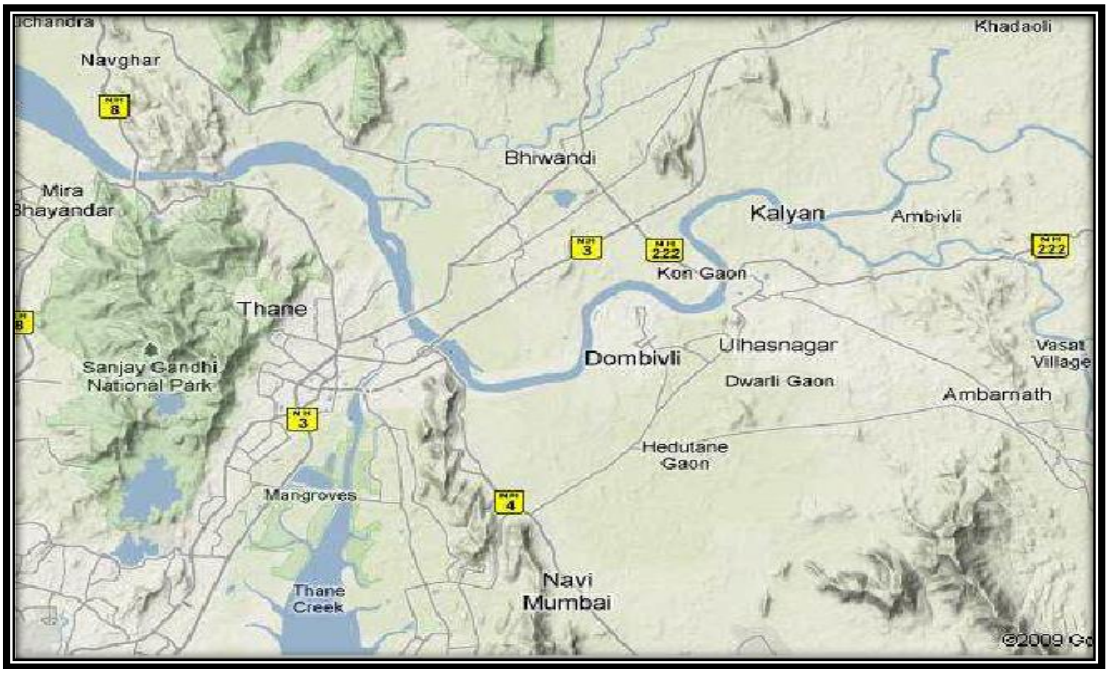
Abstract

The study considered factors related to feeding habits such as food, occurrence and feeding. The aim was to determine the relationship between the feeding habits and pollution-tolerant fish species in a contaminated habitat.Ulhas river estuary was visited from 2nd February 2023 to 7th March 2023. The seasonal food and feeding pattern of Mystus gulio (long whiskered catfish) , from Ulhas river estuary analysed from stomach content depicted the pollution status of the ambient environment based on the feeding pattern and cluster analysis. Coconut husk fibres, eggshells, chicken feathers, pieces of brick, sand particles, plastic fibres, etc., represented the non-food component of anthropogenic origin. The presence of non-food items indicates the severely degraded conditions in the study areas, especially in Ulhas river estuary. Although a native fish species tolerant of pollution, the survival of M. gulio in Ulhas river estuary is threatened.



Map of Ulhas River Estuary

Introduction

Around half of the world's fish species are found in the marine environment, and those that are edible have long provided an important food resource for humans and other animals. Fishing is now a huge commercial operation and marine fisheries have grown in size and sophistication in the last 50 years. Marine waters being highly productive serving as the home for the inhabitant organisms and the alien species. Organisms living in adjacent water bodies and landmasses. Many endemic and migratory fish share this habitat for the purpose of feeding, breeding, and shelter. Therefore, inward waters play an important role in shoreline stabilization, fish nurture, and recreation. Adversely, these water bodies have been exploited by mankind for ages, putting lots of pressure and causing heavy damage, through developmental activities like urbanization, mining, reclamation and industrialization, which may or may not be reversible.

Food and feeding habit of the fish in the estuary is of great importance in understanding their niche, behavioural patterns, life history, growth, and management of commercially important fisheries (Rathod et al., 2002;. Experts have focused on the food and feeding habit of various fish species from different parts of the world but have not concentrated the environmental condition through the feeding pattern of the fish. Food analysis methods like frequency of occurrence, feeding methods give an estimate of the proportion of the population that feeds on a particular food item. Since present study, aims to identify the food items related to pollution, these methods are suitable to include and provided the fish is non-selective feeder. It was reported that M. gulio the alteration in food composition based on declined water conditions in Ulhas river estuary.

Study areas

Ulhas river estuary was visited from 2nd February 2023 to 7th March 2023. Ulhas river estuary is the water body adjacent to Thane City in Maharashtra State, India. These waterbodies have been the source of fishing to the inhabitant fishermen supporting their livelihood since several decades. The history describes that the fishermen of the time were the richest community of the time in the Thane-Mumbai area that contributed a large part of the economy (Mukherjee, 2001).

Sampling Methods

An impressive variety of methods have been used to sample marine species, including observations, nets, hooks, traps, grabs, sediment collection, sound, chemicals and electricity (Table 6.1) (e.g., Santhanam and Srinivasan 1994; Kingsford and Battershill 1998; Tait and Dipper 1998; Elliott and Hemingway 2002; Eleftheriou 2013; Hiscock 2014). All methods are selective, at least for body size by excluding smaller and/or larger organisms. Such bias should be explicitly recognised in the design and interpretation of field data. Because of methodological biases a comprehensive sampling of marine biodiversity across habitats, body sizes and trophic levels would need to use a variety of complementary methods. Sampling Methods. An impressive variety of methods have been used to sample marine species, including observations, nets, hooks, traps, grabs, sediment collection, sound, chemicals and electricity (Table 6.1) (e.g., Santhanam and Srinivasan 1994; Kingsford and Battershill 1998; Tait and Dipper 1998; Elliott and Hemingway 2002; Eleftheriou 2013; Hiscock 2014). All methods are selective, at least for body size by excluding smaller and/or larger organisms. Such bias should be explicitly recognised in the design and interpretation of field data. Because of methodological biases a comprehensive sampling of marine biodiversity across habitats, body sizes and trophic levels would need to use a variety of complementary method

Materials and Methods

An impressive variety of methods have been used to sample marine species, including observations, nets, hooks, traps, grabs, sediment collection, (e.g., Santhanam and Srinivasan 1994; All methods are selective, at least for body size by excluding smaller and/or larger organisms. Because of a comprehensive sampling of marine biodiversity across habitats, body sizes and trophic levels would need to use a variety of complementary method.

Mystus gulio

Results and Discussion

Mystus gulio commonly found in rivers and estuaries has been explored predominantly for its feeding habit in India. The food-feeding study of M. gulio has been reported with diverse food compositions from different habitats, worldwide. It is observed that M. gulio show flexibility in food foraging being voracious and non-selective feeder. Therefore, the present study envisions of using former food and feeding parameters of M. gulio as bio-indicators in monitoring perturbed condition of habitats where the species exists. The objective is to portray the pollution status of habitats (Ulhas River Estuary) using the feeding pattern of the M. gulio. It will also be confirmed whether these observations will help in the evaluation of a similar environment with voracious and non-selective feeding fish species.

Coastal habitats with spatially and temporally different conditions could significantly influence the feeding and foraging behaviour of M. gulio. Assessing the dietary components and feeding habits of voracious and non-selective fish species

such as M. gulio is a suitable means of determining the degree of pollution of coastal waters.

Insects, diatoms, green algae, and prawns as the predominant food of M. gulio. According to Lowe-McConnel (1987), in tropical regions, regardless of the existence of fish that exhibit specialization in certain types of food, most fish species present great plasticity in their diets.

Conclusions

The present study of feeding behaviour of M. gulio exhibited that the fish subjected to high pollution stress in both the water bodies. M. gulio indicated high plasticity in food selection in Ulhas river estuary. Moreover, intensity of deviation of feeding behaviour of M. gulio from its main food towards non-food intake was increased possibly with the level of deterioration occurred in the ambient habitats. Observations include that when food is unavailable under severe conditions frequency is reduced.

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