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Food and feeding habits of *Channa striata* (1793) from Nagapur dam, Parli Vaijnath Beed district MS India

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Abstract
We conducted a study on the food and feeding behaviors of *Channa striata* (Bloch 1793) from June 2023 to May 2025. We examined the stomach contents of 120 fish specimens by identifying the predominant dietary items and morphometric characteristics. The findings revealed seven primary dietary items. preferably fish, fish larvae, crustaceans, insects and their larvae, annelids, sand and dirt particles, other stuff, and unexplained objects. The total length and body weight of fish ranged from 15 to 55 cm and 70 to 1000 g, respectively. Current research utilizes the points technique, and the distinction of food products is conducted using the GSI index. The diet similarity scale revealed seasonal fluctuations in *Channa striata*, with little overlap in summer, monsoon, and winter, but the highest overlap is observed during monsoon and winter. This study offers foundational information for formulating diets for future aquaculture methods.

Keywords: Feeding behaviour, *Channa striata*, Nagapur dam

Introduction

Food is an essential and fundamental requirement for the life of living species, such as fish. The understanding of a fish's dietary preferences and the nutritional content of its food will elucidate the habitats it frequents (Kode, 2023) [3]. Fish are directly reliant on their external environment for sustenance. Krishna *et al.* (2022b) [6] indicate that the diet of *C. striata* consists of tiny fish, crustaceans, insect larvae, annelids, semi-digested debris, and unidentifiable objects. This diverse diet highlights the opportunistic feeding behaviour of *C. striata*, enabling it to thrive in various aquatic ecosystems. As environmental conditions change, such as water temperature or availability of food sources, understanding these dietary needs becomes crucial for effective conservation and management efforts.

The food and feeding habits of several fishes of India have been studied by His study (Putriani, R. B. *et al.*, 2023) [9], which indicates that carnivorous snakehead fish predominantly take in fish fry, whereas larvae feed on crustaceans such as zooplankton. Factors like species, age, food availability, habitat, and size affect these variations. Snakehead fish frequently exhibit empty stomachs attributable to food scarcity, seasonal influences, and the duration dedicated to foraging. The research investigates (Haque, M. *et al.* 2022) [2]. We noted seasonal fluctuations in catfish diets, with minimal overlap throughout the summer and maximal overlap during the monsoon season. Individuals of smaller fish had a stronger association with appropriate food sources. Current studies by Krishna PV *et al.* (2022) indicate that both males and females exhibited increased eating intensity in August. May and June exhibited inadequate feeding, but the other months had average feeding levels. The research was investigated (Sekadende *et al.*, 2020) [10]. This study illustrated the importance of penaeid shrimps as nourishment for S. commersonnii, which constituted the principal food supply for R. kanagurta. The findings indicated that by circumventing interspecific competition for resources, the two species may coexist within the same ecological niche. The present investigation has been carried out during the period of two year extending from June 2023 to May 2025. on the food and feeding habits of *Channa striata* (Bloch 1970) [12].

Material and Method

We examined the stomach contents of 120 specimens from June 2023 to May 2025. The specimens were collected from different sites, such as Site 1, Site 2, Site 3 and Site 4 from Nagapur dam; they are situated near Parli Vaijnath, Beed district, Maharashtra, India, and their coordinates are around 18.87833° N latitude and 76.44025° E longitude. We carried the specimens to the research laboratory and noted their total length, weight, and sex. The degree of fullness of the stomach was classified as gorged, full, 3/4 full, 1/2 full, 1/4 full, and empty for studying the intensity of feeding. We record the fish's length and weight, dissect the collected gut content, and preserve it in 5% formalin. A binocular microscope examined the contents of each gut. We recorded the weight of each fish's stomach by comparing it to its body weight. The gastro so we calculated the gastronomic index of each fish using the following formula:

$$\textit{Gastro Somatic Index }(GSI) = \frac{\textit{Weight of the Stomach}}{\textit{Weight of the Fish}} \times 100$$

Point's method: (Kode 2023) [3] the degree of apparent fullness of the stomach was determined and points were assigned. Gorged (1.25); Full (1.00), ¾ Full (0.75), ½ full (0.50), ¼ full (0.25) and empty was (0.00).

Bhimachar and George (1952) [1] we determined the prevalence percentage based on the actual count of intestines containing a specific meal across various months and length categories. The *Channa striata* mostly consumes microorganisms, necessitating microscopic observations for their examination. Counting was conducted to the fullest extent practicable. Quantified each meal item and represented it as a proportion of the stomach contents in each specimen, from which the percentage composition was derived using the Number technique (Mysorekar VR, Nandedkar AN, 1979) [8]. The current study has used the same methodology.

Result and Discussion

A total of 120 *Channa striata* guts were analysed during the research period. Krishna *et al.* (2022a) [4] claim that *Channa striata* feeding habits Favor meat digestion over plant food items. Shamsan and Ansari (2010) [11] pointed out that tiny fish and crustaceans are more significant dietary components than any other objects found in the stomachs of carnivorous fish. This study indicates that fish is the preferred meal for both Channa species, with their larvae being the predominant food item during the two-year study period.

Gastro-somatic index values serve as indicators of gastric fullness that help the determination of feeding rhythms. The inquiry showed that most fish have empty stomachs. The regular presence of an empty stomach or one with minimal contents may be contingent upon the ratio of fish size to prey size, as shown by the caloric values of the diet, as elucidated by Longhurst (1957) [7]. The presence of empty stomachs in fish exhibits no correlation with either the seasonal month or the fish's size. The *Channa striata* prefer fish and their larvae, as they comprise a significant portion of their diet. These fish mainly choose to eat bottom-dwelling species, with small fish and crustaceans being their top picks (Kode 2023) [3].

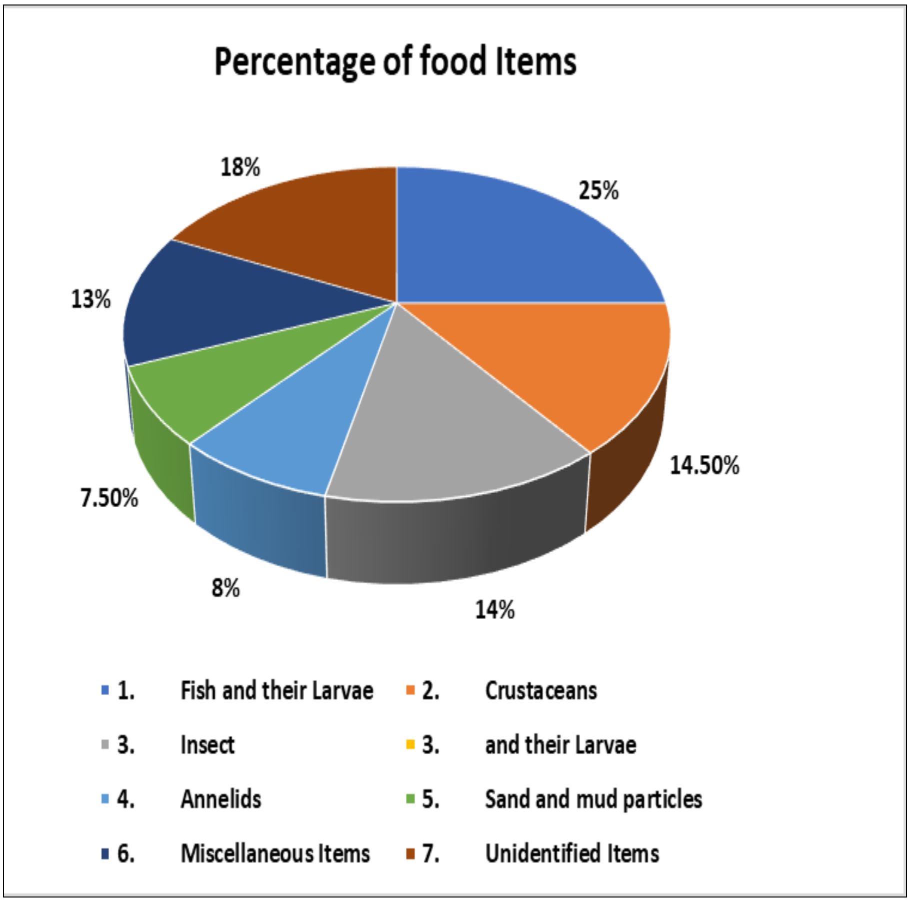

Fig 1: Percentage of food items of *Channa striata* (Bloch 1793) June, July, August & September 2023

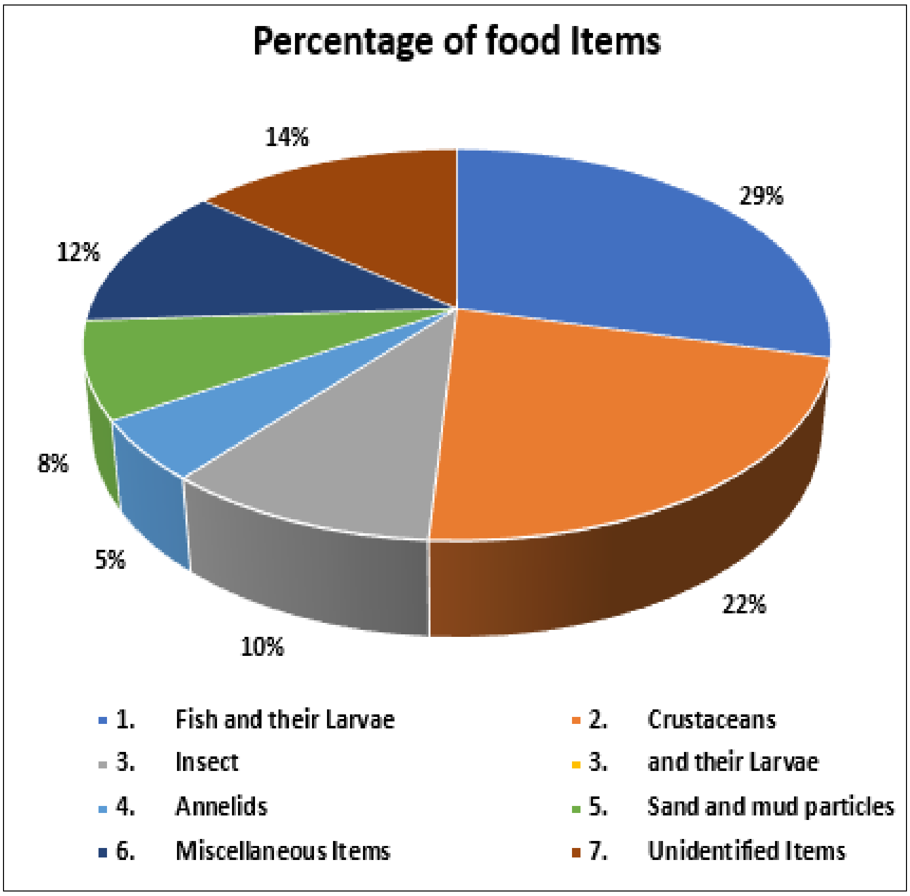

Fig 2: Percentage of food items of *Channa striata* (Bloch 1791) October, November, December 2023 & January 2024

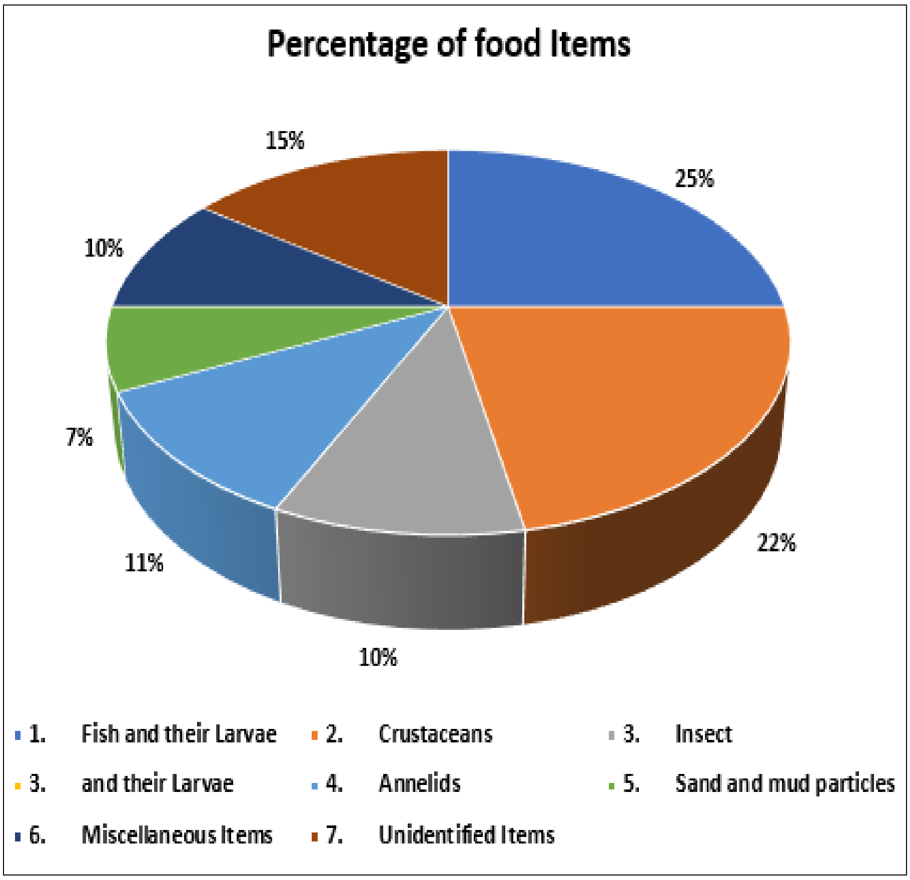

Fig 3: Percentage of food items of *Channa striata* (Bloch 1793) February, March, April & May 2024

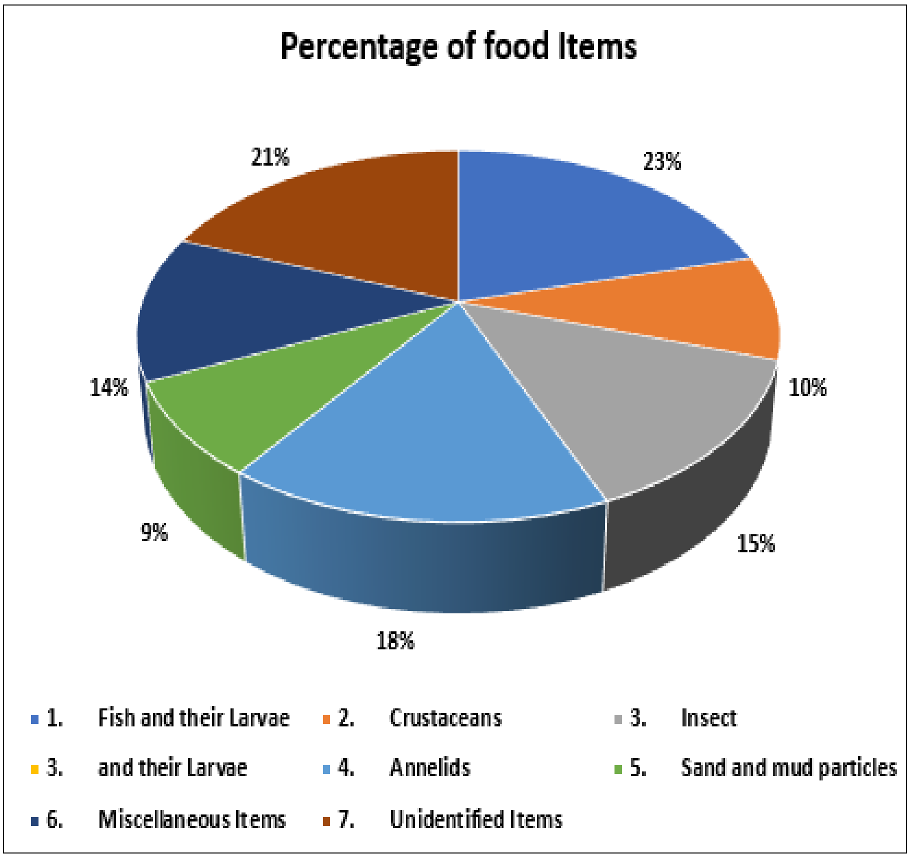

Fig 4: Percentage of food items of *Channa striata* (Bloch 1793) June, July, August & September 2024

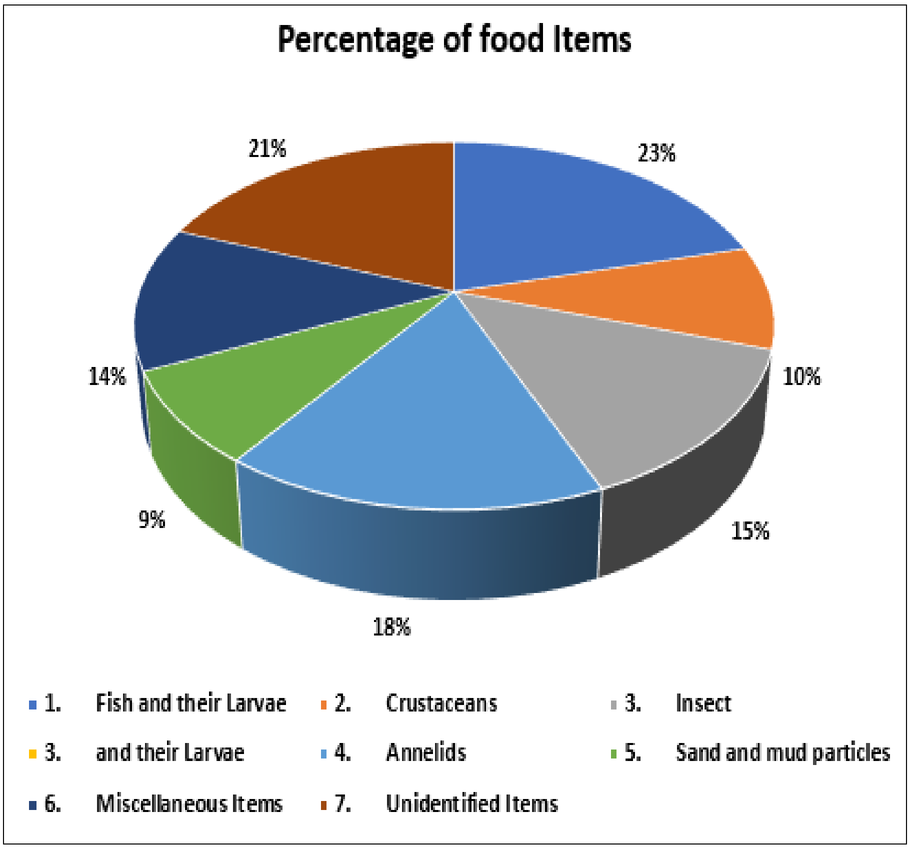

Fig 5: Percentage of food items of *Channa striata* (Bloch 1793) October, November, December 2024 & January 2025

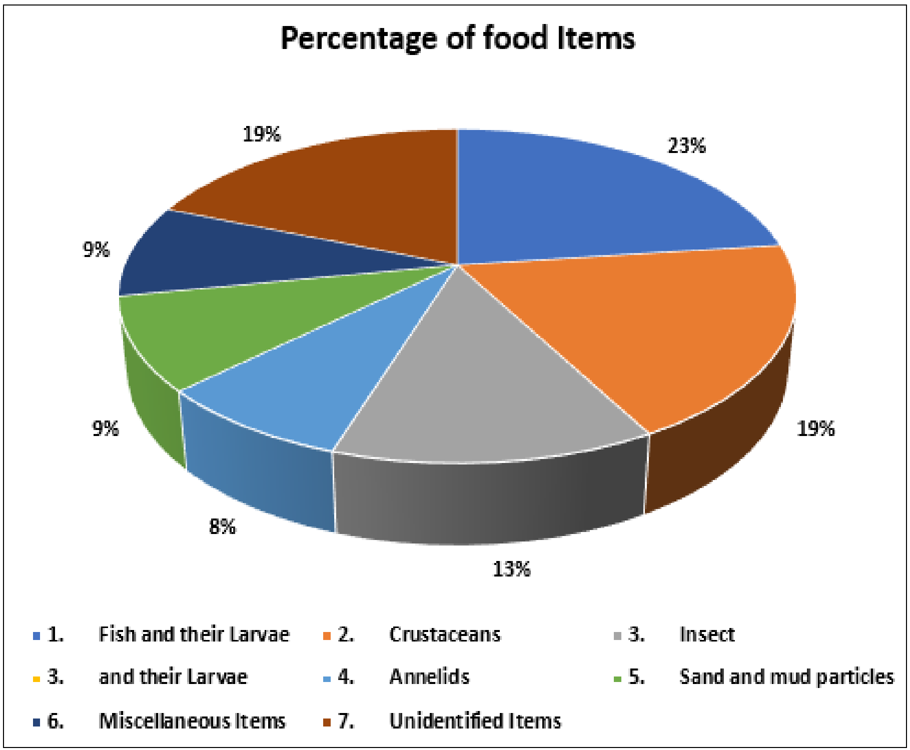

Fig 6: Percentage of food items of *Channa striata* (Bloch 1793) February, March, April & May 2025

Summary of Charts

- Chart (A) indicates *Channa striata* mostly consume fish, crustaceans, and insects, but also ingest a combination of worms, sand, and indeterminate substances. The data indicates that they are carnivorous and opportunistic eaters, consuming everything they can locate and capture.
- Chart (B) indicates that in the earlier months (June-Sept.), male *Channa striata* mainly eat fish, crustaceans, and insects. In this colder season, fish and larvae intake increased (from 25% to 29%), while unidentified items decreased slightly (from 18% to 14%). This means they remain opportunistic predators, but fish become a bigger part of their diet. The diet is quite diverse, showing that *Channa striata* can adapt to whatever is available in the environment.
- Chart (C) indicates the feeding pattern of *Channa striata* in February-May 2025 is very similar to the previous months. Fish, crustaceans, and insects still dominate the diet. Annelids (worms) slightly increased compared to earlier seasons. The percentage of unidentified food also rose slightly to 15%, suggesting some digestion may have obscured the food sources.
- Chart (D) indicates *Channa striata* eat a diverse diet, mainly consisting of fish, worms (annelids), insects, and a mix of other items. They seem to consume more annelids and unidentified materials compared to during the same months of the previous year. Crustaceans are less important in the *Channa striata* diet in this period. The presence of sand and mud suggests bottom-feeding behavior.
- Chart (E) indicates *Channa striata* continue to eat mostly fish, worms (annelids), and insects. The percentage of unidentified food is quite high, which could be attributed to their heavy digestion or preference for soft-bodied prey. Their stomachs commonly contain sand and mud, suggesting that they may feed near or on the bottom of water bodies. The diet pattern looks very similar to the previous months (June-September).
- Chart (F) indicates fish remains the top meal for *Channa striata*. Crustaceans have become more important in their diet this season. Insects and annelids are still part of the diet but not dominant. A consistent 9%-10% of their stomach contents are mud/sand or miscellaneous materials, which suggests bottom-dwelling or foraging behavior.

This present investigation focuses on the feeding behaviours of *Channa striata* in the Nagapur Dam, Parli Vaijnath, Beed district, Maharashtra, India.

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