Stomach Content Analysis of two Snapper Fishes (*Lutjanidae*) from Landing Site at Okrika Jetty, Rivers State, Nigeria.

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Abstract

The stomachs of Lutjanus agennes and Lutjanus goreensis, were studied from December-February 2021 providing insights into its feeding habits. These species are found in the coastal & brackish waters of Nigeria. They are tasty with high economic and nutritional value, the samples were collected using seine nets, hook & line gears for the study. A total of sixty two (62) stomach of Lutjanus agennes were examined, out of which 75% of the stomach were empty and Eighty-One (81) samples of Lutjanus goreensis were examined, out of which 42% of the stomach was empty. The index of relative importance (IRI) showed that the most important food item for both species were Crustaceans, aside shrimps and crabs. While the other important food items found in their stomachs included Shrimps, Crabs, and Teleost. In conclusion Lutjanus agennes and Lutjanus goreensis are carnivorous opportunistic predators & may require high protein diet during culture.

Key words: Growth, food, Lutjanidae, Nutrition, feeding habit.

Introduction

Lutjanidae (snappers) make up the key and substantial part of capture fisheries in the coastal waters of Nigeria. They are common and highly valued among the populace .Many species of *Lutjanidae* use the lagoons as nursery grounds and do change habitat as they grow. Fishes vary in choice of food and thereby have varying degrees of feeding habits. Information derived from the study the stomach content of fishes gives insight on the species food preferences and actual feeding habits. The study on the food and feeding habits of fish should be continuous as it provides the necessary data for a sustainable and progressive programme in the management of any fishery (Oronsaye & Nakpodia, 2005).

The knowledge of stomach or gut contents provides information on the food ingested, feeding, assimilation, and possible presence of cannibalism and likely differences in choice of habitat among fish species (Ajah *et al.*, 2006). In the absence of the information provided by studies on natural feeding regimes and associated behaviours in relation to predator and prey interactions, it will be difficult to have understanding and to forecast the variations that might take place as a result of possible natural or human interference in the ecosystem (Hajisamae *et al.*, 2006)

Food behaviour of various fish species have been studied for various reasons. Knowledge of the choice of food in natural systems by an organism is key in determining the nutritional needs of the organism when cultured in captivity as well as its migration to the broader fishing grounds and the resultant effects of its activities on the general ecosystem based on its ecological niche

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(Navia *et al.* 2010). Information on an organism ecological niche is important in the creation of food webs and the prediction of likely variations that that may occur in the existing food chain and the dynamics of energy transfer around the aquatic ecosystem (Rezende *et al.* 2008).

It enables us to understand the organism's interactions with other biota as well as possible competitive interactions that are prevalent, as well as predator/prey activities. Data on the food preferences do increase knowledge of ecosystem design, community composition and population changes (Ahlbeck *et al*, 2012). In the study of ichthyology, and general fish ecology, the data on food and feeding habits are essential in drawing conclusions on existing natural resources and the role they play in a balanced ecosystem. This is essential in the understanding of habitat Segregation, preferences, choice of prey and the design of successful conservation programmes. This makes it an important factor in the protection of natural biota and the ecosystem, and also providing insight in the life history of organism and their trophic roles (Braga *et al.* 2012). Therefore, the study of the fish stomach content will not only provide biological data on its ecological niche but also shed light on its likely nutritional needs should it be considered for aquaculture in the nearest future.

Materials and Method

This study was carried out at a landing site at Okrika Jetty Local Government Area, Rivers State, Nigeria. It is brackish water and its temperature varies. It lies between the coordinates $4^{0}44^{"}23^{"}$ and $7^{0}4^{"}58^{"}$ E. It lies in the North of Bonny River and Okrika Island. Figure 1.

Fish samples were collected twice monthly from December to February 2021, from artisanal fishers using seine nets, hooks and line gears. The fish were immediately fixed in 10% formaldehyde. A longitudinal cut was made across the abdomen to expose the internal organs. The gut of each fish was stretched out and the weight was measured. The content was emptied into a clean Petri dish. The food substances found in the stomach were analyzed under a hand lens and microscope, each food category within the content was indentified up to the lowest taxonomic unit (Idodo-Umeh 2003). The stomach contents were analyzed using frequency of occurring, gravimetric, numerical methods (Ugwumba and Ugwumba, 2007). Determination of the most important food items was by the use of index of relative importance (IRI) of Chukwu and Princewill (2019).



Figure 1.

Results

The variety of food items observed in *Lutjanus goreensis* (51.9% empty stomachs) includes Shrimp, crab other Crustaceans, Unidentified, and Teleost. *Lutjanus agennes* (75% empty stomachs) had similar items with *L goreensis* but excluded teleost. Other crustaceans (45.2%, and 50.9% for *L goreensis* and *L agennes* respectively) was the most important food item for both species. Variation in stomach content between species was not significant. Figure 2.

	CN	CW	%F	IRI	%IRI
Shrimp	16.1	16.9	21.1	696	15.6
Other Crustaceans	45.2	18.7	31.6	2019	45.2
Crab	3.2	28.8	5.3	170	3.8
Teleost	25.8	17.8	26.3	1147	25.7
Unidentified Items	9.7	17.6	15.8	431	9.7

Table 1: IKI of stomach Content for Lutjanus goreen

CN- percentage of numerical composition, CW- percentage of gravimetric composition, %F- percentage of frequency of occurrence, IRI- index of relative importance, %IRI- percentage of index of relative importance

Table 2: IRI of stomach Content for Lutjanus agennes							
	CN	CW	% F	IRI	%IRI		
Shrimp	28.6	13.5	20	842	15.7		
Other Crustaceans	42.9	25.4	40	2732	50.9		
Crab	14.3	34.6	20	978	18.2		
Unidentified Items	14.3	34.6	20	818	15.2		

Table 2: IRI of	stomach	Content	for .	Lutjanus	agennes
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Key: same as in table 1



Figure 2: Comparison of Index of relative importance for stomach content of Lutjanus species

Discussion

Stomach content analysis for the two species showed that for Lutjanus agennes 25% of the stomach examined was found to contain food while 75% of the stomach content were empty. This could be as a result of the fish being unable to catch prey or no food in the environment at that period. Lutjanus goreensis had 58% of the stomach examined with food while 42% of the stomach content were empty, Showing a better feeding over L agennes. The variation in percentage composition of items ingested by Lutjanus agennes and Lutjanus goreensis showed that they have different preference for prey and their hunting abilities differ. The major food items found in the stomach of Lutianus agennes and Lutianus goreensis were other Crustaceans, Teleost, Crabs, and Shrimps.

The nature and condition of food ingested by fish is critical in its classification, here Lutjanus agennes and Lutjanus goreensis are of animals materials such as Shrumps, Crabs, Teleost, Crustaceans and Unidentified items. This indicates that Lutjanus agennes and Lutjanus goreensis are opportunistic carnivores Oribhahor and Ogbeibu (2011). The prevalence of crustaceans in the diet of the snapper fishes indicate that they find it difficult to catch fast swimming prey (teleost) or that these crustaceans are in abundance in the environment.

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