THE GUT FOOD COMPOSITION AND FEEDING HABITS OF SYNODONTIS CLARIAS IN RIVER KADUNA

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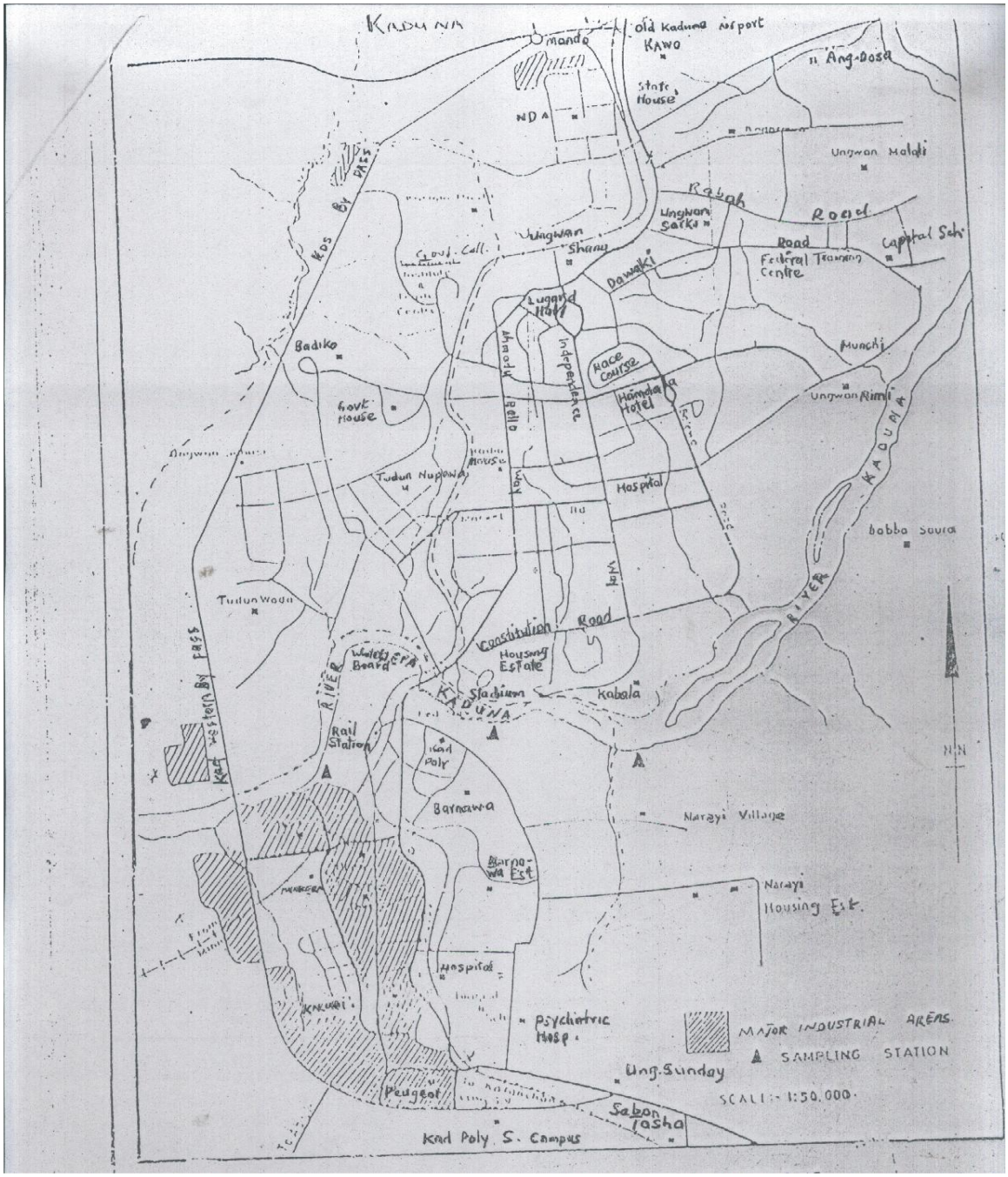
Abstract
The gut food composition and feeding habits of 215 specimens of Synodontis clarias in River Kaduna were investigated. They fed mainly on plant materials. Supplements of most available food materials included insects, small fish and green algae. The occurrence of detritus as one of its major diet seemed to indicate a benthic mode of life. The occurrence of fish in the diet during the cold dry months appeared to indicate some seasonality in the intake of food.
Key words: Food, *Synodontis clarias,* River Kaduna.

Introduction
The stomach contents of many African freshwater fishes have been studied with the objective of highlighting the food habits and its variation with size (Munro, 1957; Holden, 1970 and Ugwumba, 1991). Such studies also attempt to ascertain the dietary requirements of fishes in their natural habitat and the relationship between the fishes and their biotic environment (Fagade and Olaniyan, 1973). Investigations on some aspects of the biology of *Synodontis* species have been very limited (Olatunde; 1977). In Nigeria, Lewis, (1973) and, Willoughby (1974) worked on the ecology of the genus *Synodontis in* Lake Kainji while Olatunde (1989) worked on some aspects of the biology, of *Synodontis schall* in Zaria. In Khartoun, Bishai and Gidieri (1968) had studied the biology of the genus *Synodontis* and Irvine (1947) had reported on this group of fish in the freshwaters of Ghana. The local economic importance of *Synodontis clarias* in Kaduna provided an impetus for research aimed at investigating the gut food composition and feeding habits for the purpose of the development, of knowledge, and farming of the fish.

Materials and Methods
Two hundred and fifteen specimens of *Synodontis clarias* for this investigation were collected from the landings of local fishermen in three popular fishing areas of the River namely the Kofar Gamji area, Tudun Wada/Rigasa area and the Barnawa bridge area (fig 1). Monthly collections were carried to the laboratory in ice-cooled containers and basic routine measurements of total length, standard length and weight were recorded using the methods of Olatunde (1977). The viscera of each specimen was cut open lengthwise and the sex determined. The entire stomach and its contents were removed and visual estimation of the stomach fullness was made in accordance with the widely used classification method established by Ball (1961). The analysis of the food content in the gut of the fish was undertaken using the Frequency of occurrence and Points methods. The merits and demerit of these methods have been examined by Hynes (1950) and Windell (1968).



Result

Table 1 summarizes the observed food items of *Synodontis clarias* in River, Kaduna.

Table 1: Dietary items in the Stomach of *Synodontis clarias*

Food Items	No. in. which it occurred (frequency)	°/o Occurrence	Point gained	% Points
Plants material (Green leaves)	95	44.19	8780	48.52
Detritus	92	42.79	7965	44.02
Algae	15	6.98	540	2.98
Fish Remains	5	2.32	135	0.75
Insects Remains	8	3.72	675	3.73

Of the 215 specimens examined 15(8%) had empty stomachs. It was observed that *Synodontis clarias* fed mainly on plant materials and detritus. Plant materials (Green leaves) contributed 44% of the food items by occurrence and 48.5% by points while detritus contributed 42.79% by occurrence and 44% of the food items by points. Other food items found in the stomach included green algae, insect and fish remains. Algae accounted for 6.98% by occurrence and 2.98% by points. It was not possible to identity the type of insects and fish in the stomach since they had been partly digested. However, fish prey accounted for 2.3% by occurrence and 0.74% by points while insect remains contributed 3.7% by occurrence and 3.73% by points.

The monthly feeding variation in the diet was studied (fig 2). Plant materials and detritus dominated the stomach contents and occurred in every month of the survey. Algae occurred mostly during the rains (June, July, and October) but were not found in the diet from November to January. Fish remains were recorded in the months of December to January. Insects were however, not, consumed during the rainy months (April, June and September) but were most prominent in November. It was observed therefore that *Synodontis clarias* had a high rate of feeding intensity during the rains. It had the highest period of feeding in July and the lowest in January (fig, 3). The composition of the constituents of the diet seemed to vary with the length (size) of the fish. The total length of the fishes studied ranged from 14.5cm to 25pm while the weights varied between 5l.0 grammes to 193.5 grammes. Fish and insect remains were noticed more in larger fish with total lengths ranging from 20cm to 25cm, than in smaller fishes.

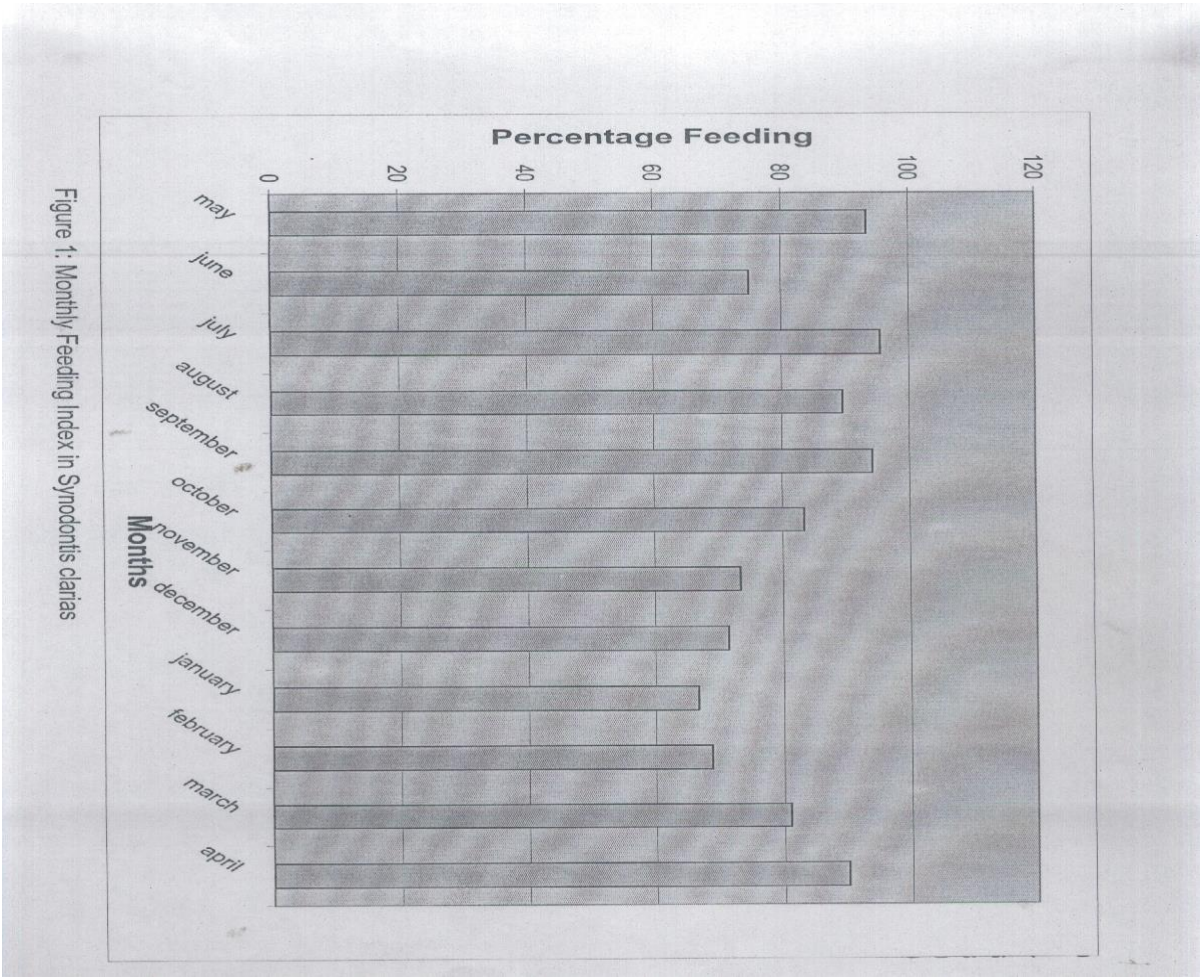


Figure 1: Monthly Feeding Index in Synodontis clarias

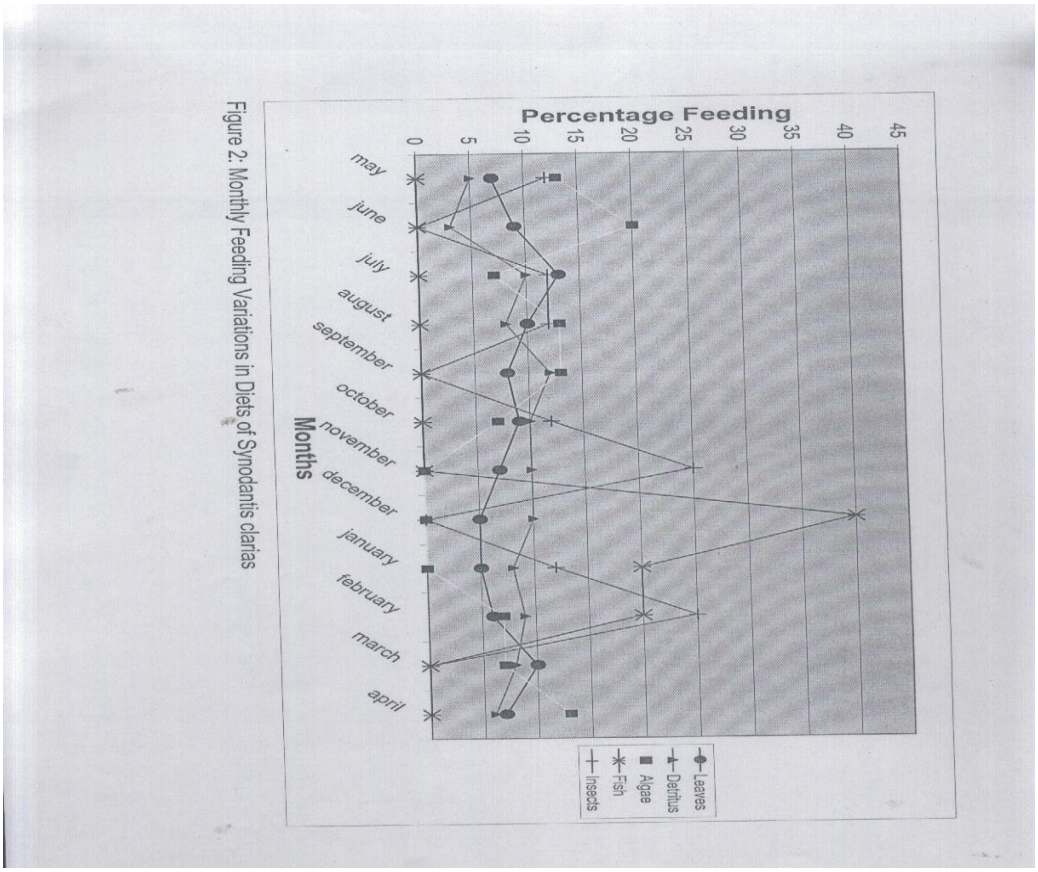


Figure 2: Monthly Feeding Variations in Diets of Synodantis clarias

Discussion

The food of *Synodontis clarias* in River Kaduna was found to be made up of plant materials especially leaves and also detritus. Supplements of green algae, insects and fish were recorded. It may be suggested that *Synodontis clarias* had an omnivorous feeding habit and are non-selective in feeding habits. Lagler (1977) had reported that all catfishes are more or less omnivorous feeders. Although a large percentage of .the food was of plant origin, the intake of insects fish and detritus complimented the protein requirement. Ball (1961) had reported that the relative extent to which different animals are eaten depend mainly upon their numerical representation in the fauna. Vass (1954) had observed that fallen fruits and leaves are food for certain fish species. Detritus formed a major component of the food and was found in all the fish examined. Hickling (1961) had shown that organic deposit form a rich source of crude protein. There is therefore some nutritional benefit derived from the intake of detritus. Also the high percentage of detritus in the stomach may suggest that *Synodontis clarias* feeds at the bottom of the River. Fagade (1971) had observed such mode of feeding for Tilapia species in Lagos lagoon.

Algal filaments were observed in the fish gut diet mostly during the rains. Fish (1955), Olatunde and Moneke (1985) had all reported the inclusion of algae in the diet of some fish species. These algae could contribute to the food requirement of the fishes. The size range examined showed some variation in: the diet of the species with, increase in length. Fish and insect remains were recorded more in the gut of larger fishes. This is in line with the findings of Cannon (1973) who had reported change in diet with increasing size m the perch. Changes in dietary items with months can be associated with the: availability or abundance, of the food item in a body of water at a particular month. This could account .for the inclusion of supplementary foods such as fish noticed, between December and February when the major

items were scarce and supports the report of Ikusemiju (1973) that in Lekki Lagoon most fish will feed on any dietary item when the major food item is in short supply.

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