



## Assessment of Feeding Habits and Total-Intestine Length Ratio of *Gymnarchus niloticus* from Katcha River, Niger State, Nigeria

\*Yusuf, M.K. and Liman, A.B.

Department of Animal Production, Faculty of Agriculture, Ibrahim Badamasi Babangida University Lapai, Niger State, Nigeria

### ABSTRACT

A total of 36 fish samples were examined between January and December for their intestine length 2018. Total- intestine length relationship showed high significant difference ( $p < 0.001$ ). Mean ( $\pm$ SD) total length of fish samples were between  $135.00 \pm 9.85$  and  $70.00 \pm 38.94$ , intestine length  $118.33 \pm 5.86$  and  $60.83 \pm 39.03$  and total length to intestine ratio  $1.28 \pm 0.07$  and  $1.12 \pm 0.01$  respectively. The ratio of total- intestine length positioned the fish as a carnivore and this was further confirmed by food items being partially digested fish, fish skeleton and detritus.

**Keywords:** *Gymnarchus niloticus*, gut content, total-intestine length, ratio

### INTRODUCTION

*Gymnarchus niloticus*, has several common names which include African knife fish, freshwater rat-tail, Aba aba and frankfish. It is a large and long fish which can attain up to a weight of 15kg. *Gymnarchus niloticus* is greatly esteemed as Hausa call it Dansarki meaning 'the son of a chief' while Yoruba call it 'Eja-Osan' orange fish because of its sweet taste and it is given to leaders as special gift (Oaldosu *et al*, 2012)

Assessment of feeding behaviour and patterns are important in successful aquaculture management (Horsfall *et al*, 2019, W.O. Abdul *et al*, 2016, Edwine *et al*, 2019). It could be used to classify fish into herbivore, omnivore and carnivore (Abdul *et al*, 2016). It is also a useful tool for fisheries managers in decision making and provides information on some aspects of biology (Adeosun 2018, Abdul *et al*, 2015). Information on fish gut contents reveals knowledge on which selection of fish culture could be based (Adeosun *et al*, 2016). The work of this nature has not been published in the study area.

### METHODOLOGY

The fish samples were collected from "Kpata Katcha", a tributary of River Niger in Katcha, Katcha Local Area of Niger State, Nigeria. Katcha is situated in Niger State, Niger, Nigeria

on Latitude: 8.76667, Longitude: 6.31667 and Altitude: 104 (Iworld map.com Nigeria, Niger State)

Fish samples were cleaned, total lengths (nearest 0.1cm) were measured with measuring tape and weights (nearest 0.1g) were taken with top loading weighing balance. Intestine lengths were measured with twine. The twine was then measured with measuring tape to get the actual record.

Dissection of fish samples were carried out at sampling site to avoid further biodeterioration. The stomach contents were preserved in 10% formalin in bottles with labels for analyses. After 24 hours they were changed into 70% alcohol (Preservation Techniques | U-M LSA Museum of Zoology, Prauli NOOTMORN, *et al* 2008)

The food items were collected into petri-dishes and examined with naked eyes and microscope. Frequency of occurrence was used to calculate each item (B.A.Shinkafi *et al*, 2010)

The data were analysed with excel and Statistical Package for the Social Sciences (SPSS).

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Address Correspondence to:

[yusuftso@gmail.com](mailto:yusuftso@gmail.com); +2348064726448

## RESULTS

Table 1. Mean ( $\pm$ SD) Gut Contents and Total Length –Intestine Ratio of *Gymnarchus niloticus* From Katcha River, Niger State, Nigeria (%)

The results of gut contents are presented in Table 1. The Mean ( $\pm$ SD) total length of fish samples were between  $135.00\pm 9.85$  and  $70.00\pm 38.94$ , intestine length  $118.33\pm 5.86$  and  $60.83\pm 39.03$

and total length-intestine ratio  $1.28\pm 0.07$  and  $1.12\pm 0.01$  respectively. Mean ( $\pm$ SD) partially digested food items were  $67.60\pm 4.58$  and  $34.33\pm 26.03$ , fish skeleton  $36.93\pm 10.08$  and  $24.00\pm 8.00$  and detritus  $38.10\pm 22.84$  and  $9.87\pm 1.50$  respectively. Results of food items are presented in Table 2. Mean ( $\pm$ SD) partially digested food items were  $34.33\pm 26.03$  and  $67.60\pm 4.58$  fish skeleton  $22.53\pm 3.09$  and  $47.00\pm 1.73$  and detritus  $9.87\pm 1.50$  and  $38.10\pm 22.84$  respectively

Table 1. Mean ( $\pm$ SD) Gut Contents and Total Length –Intestine Ratio of *Gymnarchus niloticus* From Katcha River, Niger State, Nigeria

FNS	TL(cm)	IL(cm)	TL TO IL RATIO	Months
3	$112.33\pm 6.81$	$92.00\pm 4.36$	$1.22\pm 0.03$	January
3	$123.67\pm 11.72$	$104.33\pm 4.73$	$1.18\pm 0.08$	February
3	$131.00\pm 6.08$	$109.67\pm 8.02$	$1.20\pm 0.04$	March
3	$135.00\pm 9.85$	$118.33\pm 5.86$	$1.14\pm 0.03$	April
3	$130.00\pm 10.39$	$113.67\pm 8.33$	$1.14\pm 0.03$	May
3	$123.33\pm 18.34$	$101.67\pm 8.02$	$1.21\pm 0.09$	June
3	$130.33\pm 12.01$	$101.67\pm 5.51$	$1.28\pm 0.07$	July
3	$125.67\pm 6.81$	$110.67\pm 5.86$	$1.14\pm 0.00$	August
3	$115.67\pm 8.33$	$101.67\pm 6.43$	$1.14\pm 0.01$	September
3	$119.33\pm 8.74$	$106.67\pm 8.33$	$1.12\pm 0.01$	October
3	$103.33\pm 40.13$	$89.33\pm 37.54$	$1.17\pm 0.06$	November
3	$70.00\pm 38.94$	$60.83\pm 39.03$	$1.19\pm 0.10$	December

Key: Fish Number Sampled (FNS), Total Length (TL), Intestine Length (IL)

Table 2: Mean ( $\pm$ SD) partially digested food items, fish skeleton and detritus of *Gymnarchus niloticus* From Katcha River, Niger State, Nigeria

FNS	SL(cm)	PDF	FS	Detritus	Months
3	$101.67\pm 7.23$	$61.53\pm 8.52$	$25.23\pm 2.47$	$13.23\pm 6.13$	January
3	$115.67\pm 11.24$	$42.77\pm 17.92$	$36.93\pm 10.08$	$20.30\pm 12.27$	February
3	$122.67\pm 5.51$	$67.60\pm 4.58$	$22.53\pm 3.09$	$9.87\pm 1.50$	March
3	$126.00\pm 8.89$	$53.63\pm 5.71$	$34.43\pm 7.94$	$11.93\pm 2.28$	April
3	$121.00\pm 8.89$	$34.90\pm 17.32$	$27.00\pm 7.94$	$38.10\pm 22.84$	May
3	$115.33\pm 14.74$	$38.07\pm 38.67$	$26.13\pm 18.27$	$35.80\pm 25.26$	June
3	$119.33\pm 9.50$	$39.00\pm 2.00$	$47.00\pm 1.73$	$14.00\pm 1.00$	July
3	$117.33\pm 6.43$	$39.00\pm 7.00$	$36.33\pm 11.72$	$24.67\pm 5.51$	August
3	$107.67\pm 7.37$	$41.33\pm 19.73$	$34.00\pm 12.77$	$24.67\pm 14.57$	September
3	$113.33\pm 8.74$	$64.00\pm 5.20$	$24.00\pm 8.00$	$12.00\pm 4.36$	October
3	$96.00\pm 38.12$	$50.00\pm 19.29$	$31.33\pm 12.42$	$18.67\pm 7.09$	November
3	$64.67\pm 38.37$	$34.33\pm 26.03$	$33.67\pm 1.55$	$32.00\pm 28.00$	December

Key: FNS-Fish Number Sampled, SL-Standard Length, IL-Intestine Length, PDF-Partially Digested Fish, FS- Fish Skeleton, M-Months, January-December

## DISCUSSION

The gut contents of *Gymnarchus niloticus* shows that it is a carnivorous fish. The food items found were partially digested fish, fish skeleton and detritus. The mean ( $\pm$ SD) standard length to intestine ratio were between  $1.12\pm 0.01$  and  $1.28\pm 0.07$ . Sandipan Gupta and Samir Banerjee (2013) reported that Relative Length of Gut (RLG) for carnivores (0.5-2.4cm), omnivores (1.3-4.3 cm) and herbivores (3.7-6.0cm). (Eugenia Zandonà et al,2015, Onyeche et al,2013) also gave similar report that fish with long guts were classified as herbivores and those with short guts were carnivores.

## Conclusion

The ratio of total to intestine length revealed the position of the fish as a carnivore and this was further confirmed by food items being partially digested fish, fish skeleton and detritus.

## REFERENCES

- Abdul W.O., Omoniyi I. T., Adekoya E.O., Daniel O.S. and Olowe O.S. (2015). Some Stock Parameters of *Esop lacerta* During Estuarine Phase of Life History. *Ife Journal of Science*, 17 (2)
- <https://www.ajol.info/index.php/ijs/article/view/131733/121334>
- Adeosun FI, Amrevuawho MO, Owolabi SA, Abdul WO, Odulate DO, Idowu AA (2016). Natural Diets and Length- Weight of *Brycinus macrolepidotus* in Lower Ogun River
- Akomeje, Ogun State. *International Journal of Fisheries and Aquatic Studies* 4(3):139-143
- <http://www.fisheriesjournal.com/archives/2016/vol4issue3/PartB/4-2-7.pdf>
- B.A. Shinkafi, LA. Argungu and H.S Akanbi (2010). Food and Feeding Habits of Catfish (*Synodontis nigritra* Cuvier and Valenciennes) in River Rimi. Sokoto State, Nigeria. *Nigerian Journal of Basic Applied Science*, 18 (2):304-307
- <https://www.ajol.info/index.php/njbas/article/view/64348/52141>
- Edwine Yongo, Jacob Iteba and Simon Agembe (2019). Review of Food and Feeding Habits of Some Synodontis Fishes in African Freshwaters. *Oceanography, & Fisheries Open Access Journal* 10 (2) <https://juniperpublishers.com/foaj/pdf/FOAJ.MS.ID.555781.pdf>
- Iworld map.com Nigeria, Niger State
- E.O. Horsfall, G. M. Sokari, M. Moslen and I. K. E. Ekweozor, (2019). Stomach content, Length- Weight Relationship and Condition Factor of *Tilapia* spp. Found in the Sombrero River across Three Communities in River State, Nigeria. *African Journal of Fisheries and Aquatic Research* 3(4): 1-14.
- Eugenia Zandonà, Sonya K. Auer, Susan S. Kilham, and David N. Reznick, (2015). Contrasting Population and Diet Influences on Gut Length of an Omnivorous Tropical Fish, the Trinidadian Guppy (*Poecilia reticulata*). *Plos One* 10(9) <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4567299/>
- Festus Idowu Adeosun (2018). Food and Feeding Habits and Length-Weight Relationship of *Parachanna obscura* from Federal University of Agriculture Reservoir Abeokuta, Ogun State, Nigeria. *Journal of Tropical Agricultural Science*, 41 (3): 1139-1150
- [http://www.pertanika.upm.edu.my/Pertanika%20PAPERS/JTAS%20Vol.%2041%20\(3](http://www.pertanika.upm.edu.my/Pertanika%20PAPERS/JTAS%20Vol.%2041%20(3)
- Oladosun, O.O. and Oladosun, G.A. and Hart, A.I. (2012). Some ecological factors of the tropical floodplain influencing the breeding and conservation of *Gymnarchus niloticus* (Cuvier 1829): a review. In: 26th Annual Conference of the Fisheries Society of Nigeria (FISON) , 28 Nov - 2 Dec 2011 ,Minna, Nigeria, pp. 193-200.
- Onyeche V.E.O., Onyeche L.E. Akankali J. A., Enodiana I. O. and Ebebuwa P.(2013). Food and Fish Feeding Habits in Anwai Stream Ichthyofauna, Niger-Delta. *International Journal of Fisheries and Aquaculture* 5(11):286-294.

Prauli, NOOTMORN, Montri SUMONTHA, Pornanan KEEREERUT, Rangkiri P.P. Krishantha, JAYASINGHHE, Nalla JaAGANNATH and Manas Kumar SINHA (2008) Stomach Content OF THE Pelagic Fishes in the Bay of Bergal. Preservation Techniques | U-M LSA Museum of Zoology

<http://www.fao.org/3/a-bj241e.pdf>

Sandipan Gupta and Samir Banerjee (2013). Food and Feeding Habit of *Amblypharyngodon mola* (Hamilton-Buchanan, 1822) in West India. *International Journal of Scientific Research* 2(5): 67-71  
<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.681.1412&rep=rep1&type=pdf>

W.O .Abdul, I.T. Omoniyi, A.O. Agbon, F.I. Aeosun, O. L. Olowe and E.O. Adekoya (2016). Food and Feeding habits of Some Fish Species in Ogun State, coastal Estuary, Ogun State, Nigeria. *Journal of Agricultural Science and Environment*, 16 (1): 61-74  
<http://journal.unaab.edu.ng/index.php/JAgSE/article/view/1682>