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The biology of the spotted sucker *Minytrema melanops* "Rafinesque, 1820" from the River Niger at Agenebode, Edo State Nigeria

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Abstract
The Spotted sucker (*Minytrema melanops*) is a member of the Catostomidae, or "sucker" family. In Nigeria, it is reported to inhabit the fresh waters of the River Niger throughout the year in large catches. No known documentation about the Spotted sucker (*Minytrema melanops* is available for Nigerian waters and reservoirs. With the need to provide cheap and high nutrient sources of protein, the growing population is gradually shifting its demand on this cheap source of fish supply. There are a lot of unknown about this fish, it is therefore necessary that this fish species be considered as a virgin land for exploits, its biology should be studied and knowledge obtained to pursue it propagation and production. Information obtained could pave a way for its introduction into the streams and reservoirs in Nigeria to make necessary its propagation, culture, breeding and conservation and management.
Fifty nine (59) fish species were collected fortnightly for 12 months from November 2019 to October 2020 from three stations (based on the landing sites of fishing localities).
27 males and 42 females were examined with a ratio of 1:1.5. The spotted suckers feed on a variety of food items. The adult and juveniles do not show feeding specificity though most of the stomachs observed in this study had sand and other detritus materials. Copepods and crabs were the most important of food items with regards to relative importance index. The Relative Gut Length (RGL) of *M. melanops* was expressed as 0.34. The prey–predator relationship of *M. melanops* revealed that fish weight was more related to prey size
The prey–predator relationship of *M. melanops* revealed that fish weight was more related to prey size. The findings in this study reveal that *M. melanops* has a small, slim, compressed body with an inferior mouth that is void of teeth, the upper-lip is thick and stocky. M. melanops exhibits negative allometric pattern (b=0.98). M. melanops is a carnivore with a preference for Arthropods. Females had two ovaries and gravid females with high fecundity observed in the months of September, October and November. Only one peak of spawning period was observed. *M. melanops* is considered a high fecund fish.

Keywords: negative allometric growth, gravid, fecundity, carnivore, ovaries

Introduction

The Spotted sucker (*Minytrema melanops*) is a member of the Catostomidae, or "sucker" family. They are native to much of East America, they inhabit a broad range of freshwater habitats. Most frequently, the spotted sucker inhabits deep pools of small to medium rivers over clay, sand or gravel. They are occasionally found in creeks and large rivers. Through its life stages, the spotted sucker goes from a mid-depth predator to a bottom forager. (EDWARDS, 1983, KLEINHOLZ, 2000, FULLER, 2008) [10, 24, 13]. In Nigeria, it is reported to inhabit the fresh waters of the River Niger throughout the year in large catches, though large sizes have not been documented (AGBUGUI *et al*., 2019) [1, 2]. No other known documentation about the Spotted sucker (*Minytrema melanops* is available for Nigerian waters and reservoirs. This species is easily identified from its inferior mouth, which is comprised of thick, lips, with the upper lip curved to meet the lower lip. The fish species are not particularly among the treasured fish of the fisher folks and residents along the River Niger and the natives of Agenebode. The fish is cheap and preferable smoked for added taste and value. In any case it readily serves and satisfies a class of the population that can afford it. With such a fish species at its availability, the poorest of the poor is sure to have an affordable, regular and optimal source of animal protein rich in essential nutrients (WHO 2004, WHO 2015) [43, 44].
Minytrema melanops is not listed among the endangered fish species in the world (LACKMAN *et al*., 2019, FROESE and PAULEY, 2020, BIGMOUTHBUFFALO, 2021) [25, 12, 6] but the growing population is gradually shifting its demand on this cheap source of fish supply particularly when other economically valued fish species are scare at Agenebode. The gradual demand for this fish is an eye opener for researchers to avail information about this unique fish species particularly when production and propagation is still at the wild and could be managed successfully in reservoirs or ponds.
The sudden rise in demand of this cheap source of animal protein along the River Niger at Agenebode in the recent past has paved a way for this study since the only information about the *M melanops* is at its taxonomic level and has not received any extensive study of its biology. Furthermore, the need for varieties of cultured fish species to reduce the demand for fish species obtained in the wild, reduce overexploitation, overfishing and drastic decline of the fish in the wild and to meet the global need for various sources of nutrient rich sources of fish protein is of the essence. Again, because there are a lot of unknown about this fish, it is therefore necessary that this fish species be considered as a new field for exploits, its biology should be studied and

knowledge obtained to pursue it propagation and production. Management of the spotted sucker is thus in urgent need of reevaluation, at least in the regions of Nigeria where the environmental and geographical conditions meet the criteria for propagation, breeding and culture. To promote the awareness, demand, production, culture, propagation of this cheap source of fish protein at a commercial scale, it is therefore necessary that ample knowledge of the biology of *M. melanops* be studied to provide maximal information that should provide baseline information with a view to effectively manage the species for sustainable fisheries, hence, this research is aimed at the study of the biology of *M. melanops* in the River Niger at Agenebode to determine the anatomy and physiology and histology of its mouth and Gastrointestinal tract, Distribution, Morphometric, Feeding Evaluation and the Reproductive Capacity.

Materials and Methods

Study Area

The River Niger at Agenebode is located at 706'N 642'E. Agenebode is a waterside town located by the banks of the River Niger (Fig 1). It is located at the lower River Niger, typically with a humid climate and weather of approximately 32 º C.

The area is marked by 2 seasons, the wet season and the dry season. The wet season is from April to October while the dry season is from November to March. The River serves the people of Edo and its environs with a route for transportation to other neighboring communities; a fishing spot and fishery; market and a source of water for domestic purposes, farm, irrigation, industrial purposes and trading location for local traders and the riparian localities at the popular Agenebode Market.

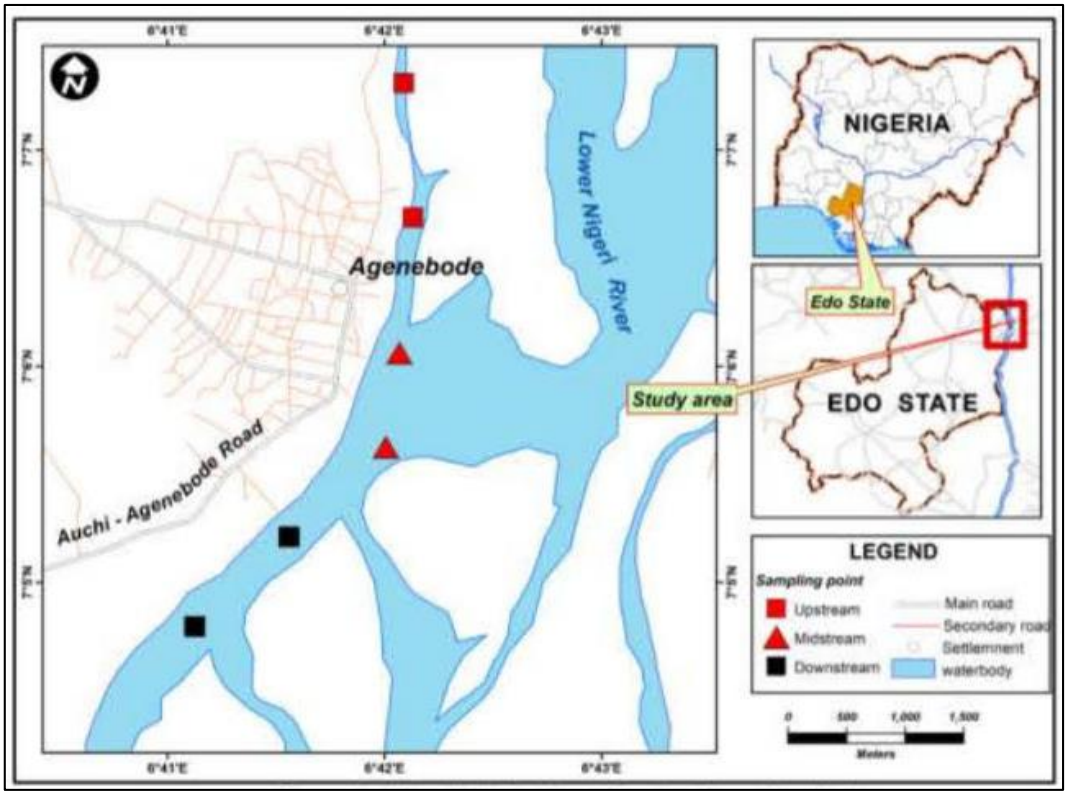

Fig 1: Map of Study Area Showing Sampling Stations

Collection of specimens and sampling

A total of fifty nine (59) fish species were collected fortnightly for 12 months from November 2019 to October 2020 from three stations (based on the landing sites of fishing localities) from catch landings of fisher folks by the use of canoes, gill nets, cast nets, drag nets, fish traps and calabashes. Samples of fishes were transported to the Laboratory of the Department of Biological Sciences, Edo University Iyamho, Edo State. Fishes were rinsed, wiped dry and identified to species level using guides, keys and pictures provided by FROESE and PAULY 2020 [12] and REED *et al*., 1967 [34] and PANDEY and SHUKLA (2005) [32] and then preserved in 5% formalin.

Morphological Parameters

The standard length (cm), total length (cm), head length (cm), gape mouth (cm), girth length, and weight (g) of *M. melanops* were obtained by using a graduated ruler and tape a measuring board and a digital electronic scale (Storius 177). These were recorded and analysed. Fin counts and measurements were also taken and recorded.

Determination of Sex

Sex could be determined by external observation. The lower lobe of the anal fin and lower lobe of the caudal tail are longer in the males. Tubercles are also present on the head region of most males. In addition, the stomach was split open from the lower abdominal region to confirm the sex by visual and microscopic observation of the gonads.

Length – Weight Relationship (LWR)

The total length (TL), standard length (SL) and body weight (W) were measured from the fresh samples to the nearest 0.1 cm and 0.01 g respectively. The length – weight relationships were estimated from the formula, W = a L b, where W is total body weight (g), L is the total length (cm), a and b are the coefficients of the functional regression between W and L. This relationship was transformed into a linear form by the

equation:

$$Log\ W = Log\ a + b\ log\ L$$

Condition Factor
The condition factor 'K' was calculated by the following formula given by (PAULY, 1983):

$$\frac{(K = 100\ W)}{L^3}$$

Where: W = total weight of fish in grams; K = condition factor; L= total length of fish in centimeters. It was calculated for both sexes separately and then for the combined sexes. Variations of K with season and size groups were also determined.

Anatomy
20 samples of *Minytrema melanops* comprising of different sizes (length and weight) were analysed. The mouths and intestinal tracts were removed, the oesophagus, stomachs and intestines were gently slit open, their content rinsed off in gently flowing tap water, and thereafter fixed in 10% formaldehyde.
Pictures of the mouth, jaws and pharyngeal teeth and GIT were taken with a digital camera (Model X650B).

Gonadosomatic Index (GSI)
The Gonadosomatic Index of samples of *M. melanops* were determined according to UGWAMBA *et al*., (1991) as follows

$$GSI = \frac{weight\ of\ gonad}{weight\ of\ fish} X\ 100$$

The monthly catches were sorted into sexes. The mature female ovaries were analysed and used to determine the GSI.

Fecundity
Both ovaries of the mature fish were removed and placed gently in boiling water and allowed to boil for 20 minutes. The eggs became hard enough for easy counting. The boiled eggs were then stored in 5% formalin. 1.00g of the whole ovaries was cut off. The cut section of the eggs were carefully counted and multiplied by the total weight of the ovary to give the total number of eggs.
The maturity stages of the ovaries were classified according to NIKOLSKY (1963) [30]:
Stage 1 – Immature, Stage II-Quiescent, Stage III - Maturing, Stage IV-Mature,
Stage V - Running, Stage VI -Spent.

Egg diameter
Egg diameter (mm) was measured with an ocular micrometer. A stage micrometer was earlier used to calibrate the microscope. Diameters of twenty eggs randomly selected from each ovary were measured and their mean was taken as the average egg diameter.

Determination of Food and Feeding Habits
Each stomach was split open and the contents emptied into a petri dish. The contents were observed under a hand lens and the food materials and identified.

Frequency of occurrence method (FO)
In the frequency of occurrence method the individual food matter in the stomach were sorted and identified. The number of stomachs in which each food item occurred was expressed as a percentage of the total number of stomachs with food examined.

Numerical method (NO)
This method involves counting the number of each food item present in the stomach of a fish and summing these numbers to obtain the total number of all food items found in the stomach. The number of each food item is then expressed as a percentage of the total number of all food items. It was expressed as

$$Percentage\ number\ of\ a\ food\ item = \frac{Total\ number\ of\ individual\ food\ items}{Total\ number\ of\ all\ food\ items}$$

Importance of food index (IRI)
The importance of various food items were determined with the index of food importance following a method UGWUMBA and UGWUMBA (2007) [39]

$$IRI = (Cn + Cw)\ X\ F \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where IRI = index of relative importance
Cn = percentage of numerical composition
Cw = percentage of gravimetric composition
F = percentage of frequency of occurrence

The dietary compositions for the species examined were expressed as percentages, that is

$$\%\ IRI = (Cn + Cw) X\ F\ X\ 100 \ldots\ldots\ldots\ldots\ldots\ldots \quad (2)$$

Food item with %IRI ≥ 3 are regarded as primary, ≥ 0.1 to <3 are secondary whereas ≤ 0.1 are considered as incidental food items.

The Relative Gut Length (RGL)
This was expressed as the ratio of total length of gut to total body length (BISWAS, 1993) [7].

$$RGL = \frac{total\ length\ of\ gut}{total\ length\ of\ fish}$$

Where fish can be classified as herbivorous when RLG>1, carnivorous if (RLG<1>0.6) or omnivorous (RLG < 0.5).

Prey-predator relationship
The relationship between the total body length and total weight of *M. melanops* and prey body weight was determined and described by the equation;

$$YL = a + bXL\ (Ogari, 1988)$$

Where YL = Prey body weight (g), XL = *M. melanops* body length (cm) or body weight (g).

Statistical analyses.
The Microsoft Excel 2010 was used to analyse the data obtained for this study.

Results and Discussions
A total of 69 *Minytrema melanops* were obtained during this

study. Males are often differentiated from females by using the caudal fin and the anal tail fin and the use of tubercles that appear on the head and observation of the gonads for confirmation of sex. The spotted sucker (*Minytrema melanops*) in the River Niger at Agenebode has laterally compressed body, an inferior mouth, the lower lip is shorter than the upper lip, the upper lip is thick and stocky, and this helps it to feed on bottom dwelling animals and planktons by sucking them into the mouth (Fig. 1). The body colour is greenish –black, the sides are yellowish and the belly is white.

Plate 1: Body of a male spotted sucker *Minytrema melanops*

This body colour is said to vary greatly across individuals probably because of habitat as reported by NATURESERVE, (2013) [29] in North America to be typically brownish- olive with dusky fins. Spotted suckers have a dark spot at the base of each scale giving them the appearance of parallel lines on sides of having many rows of small black spots on their body. The lower sides are lighter grey and the belly is white. The spotted sucker rarely have lateral lines, when visible, it is incomplete. The dorsal, pectoral, pelvic, and caudal fins often have red and sometimes pink tinting, and all fins have heavy dark pigmentation along rays. The fins of the spotted sucker are made of tough rays. D14-19; C6-12; P 16-18; V10-12; A8-12; $L\frac{6}{6}$.These meristic parameters are used in accurate description of this fish species. The variation in fin count is due to size of fish with regards to age. Dorsal fin is short with the anterior rays longer than the posterior rays, caudal fin is forked. These findings are in agreement with those of (HUBBS *et al*. 1991, ROSS 2001, SPOTTED SUCKER 2013) [18, 35, 36]. The body is slim, compressed, girth (depth) is 6% of its total length.

Plate 2: Head region of *M. melanops*. Head with tubercles, Operculum ends with flesh

Plate 3: Inferior mouth region of *M. melanops*. The mouth is small, the tongue is attached to the lower lip.

The mouth is inferior, void of teeth, the upper-lip is thick and stocky. The snout curves beyond to meet the lower lip, the tongue is thick and extends to the tip of the mouth (Fig. II and Fig. III). Mouth is small opening just 0.05% of its total body length (Fig. 3). This is expected as nature has designed it to suck up food materials. The small mouth provides enough suction pressure needed by the fish. Furthermore, the flesh attached to the operculum helps to secure loss of air to avail suction by the fish (Fig. II). Similar reports of a bottom dwelling fish with such suctorial ingestion was by given by WEISEL, (1962) [41] on *Catostomus catostomus* in North America. There are four distinct pairs of gills. The fifth pair are fused together to form a base on the lower surface of the mouth. The gills have few and spaced 92-95 gill rackers (Fig. 4). The filaments (106-109) are numerous and long. In-between these four pairs is a fifth gill-like structure with slits. Right after the gills are the pharyngeal teeth with 58-88 molariform teeth, which are arranged in five rows on either side of the throat. The molariform teeth easily fall off from its base suggesting easy replacement, the number of teeth are also related to size of the fish (Fig. 5). This indicates that during crushing of hard shells, the teeth could fall off their base but its rapid replacement could help it sustained in its feeding regime which was reflected in the result of its food and feeding

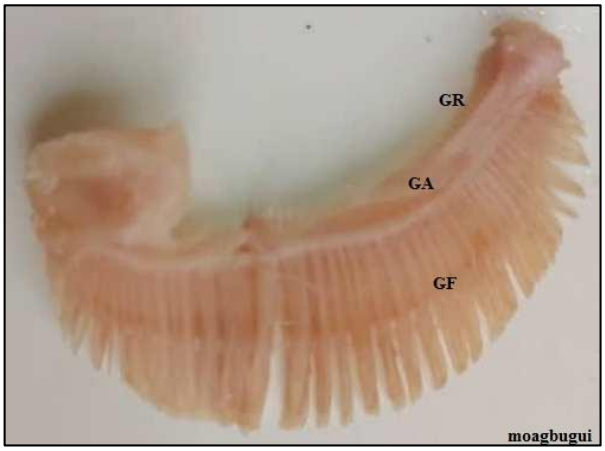

Plate 4: One gill of *M. melanops*. GA, Gill arc: GF,gill filament: GR, gill racker

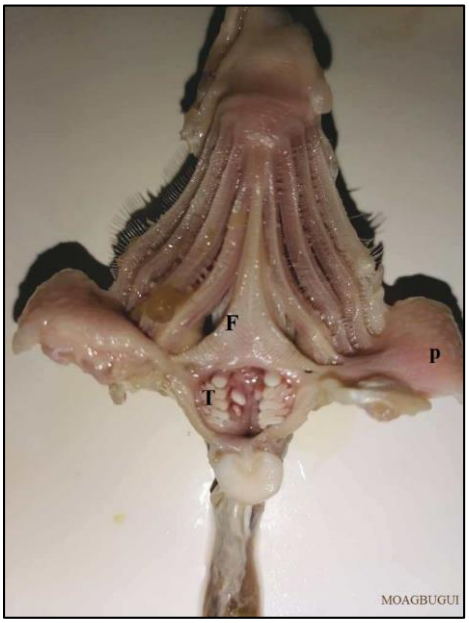

Plate 5: Buccal cavity of *M. melanops.* F, Fused end of gill filament: T, teeth: p, pharyngeal teeth of soft pebbles on soft palate

habits. The number, size and rows of teeth increases with size of fish. The upper pharyngeal Fig. is not bony or stony possesses with soft flesh with tubules. The swim bladder is large and bilobed, divided into two parts with the aid of a pneumatic duct (Fig. 6).The second half is longer than the first and gradually reduces to its tapered end. It is 45% of the total body length. Air is sucked in from the gut through the gills to the air sac and if increase in a volume of air is desired it can be gulped in at surface and forced into the bladder through pneumatic duct. It has been reported that the function of the swim bladder in fishes is to control their buoyancy, and thus permit the fish to stay at their current water depth without having to waste energy in swimming, It is also to more effectively detect vibrations in the water due to connection to the Weberian apparatus, again while most of the sucker species do have large swim bladders their bodies and skeletons are rather heavy, suiting them to their benthic lifestyle (FISH, 1999) [11].

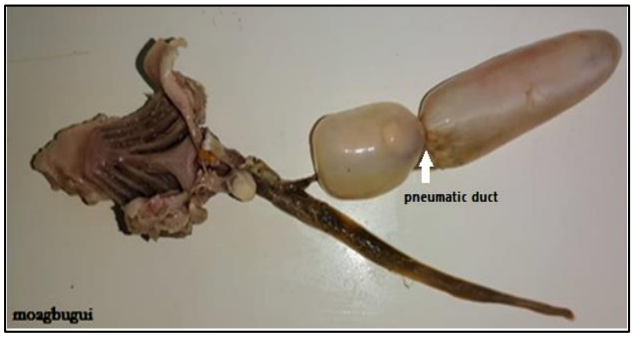

Plate 6: The gut of *M. melanops* showing intestine and swim bladder

Morphological differences in size and shape, and number of chambers in the swim bladders vary between and can help identify the species. Size of the swim bladder corresponds to where the fish spends most of its time (suspended above or on the bottom) just as with pharyngeal teeth, helps to indicate the types of feeding habits. (GRASSEL *et al*., 2011; AGBUGUI and ONIYE 2019; AGBUGUI *et al*., 2014) [16, 1, 2, 3].

The intestine is short and hardly differentiated into sections and was observed to be 3-4% of its total body length (Fig. 6). This finding is in agreement with (HUBBS *et al*., 1991, GOLDSTEIN and SIMON, 1999) [18, 15]. *M. melanops* are not obtained in large quantities at Agenebode, this could either be that the spawning grounds are often destroyed or the fish is a good prey for other larger fish species, are migrating to other habitats, the river is not a perfect habitat or the unavailability of desired feeds reduces their distribution. *M. melanops* are known to inhabit rocky plains and rivers and streams with rocky bottom, Out of the 69 specimens collected in this study, the largest size of fish obtained in this study was 47cm and 1047g. The spotted suckers are not particularly the extra sized fish hence its sizes as obtained from the river or, the fish species is over fished thus depriving the population from reaching maximum size. The average sizes obtained from the River Niger are $24.09 \pm 8.17 cm$ and $453.65 \pm$ 189.32g. This shows that the fish is a medium sized fish. Though WHITE and HAAG, (1977) [42] had reported that the changes in range and abundance of Minytrema may be directly related to stream alterations affecting its food supplies and feeding habits. In Nigeria, there is hardly any report of the spotted sucker in its water bodies though reports of scanty numbers of fishes on the family Catastomidae has been reported by AGBUGUI *et al*. (2019) [1, 2] in the River Niger at Agenenbode. A drastic decline of the suckers has been reported by researchers in the Americas and even an extinction proposed by COOKE *et al*, (2005) [9], the presence of these species in this River could be directly related to favourable alterations and physicochemical parameters of the river, adequate food supplies for compliment feeding habits and probably favourable spawning grounds. COOKE *et al*. (2005) [9] reported that threats such as migration barriers, flow regulation, environmental contamination, habitat degradation, exploitation neglect, ignorance, and misunderstanding of this fish species of Catostomids in different regions, will lead to its extinction, also that conservation strategies should include protecting freshwater protected areas for critical habitat, restoration of degraded habitat, and design of Catostomids-friendly fish bypass facilities.

Total weight and standard length of the 69 specimens of *M. melanops* examined were within the ranges of 145 - 1047g (453.21± 189.34) and 10.0 – 47.0 cm (24.09cm ± 8.17) respectively. The Length Weight Relationship (LWR), of *M. melanops* obtained in the study revealed the correlation coefficient (r) of 0.91. The value obtained for b was 1.10 and was highest during the rainy season. The Length Girth Relationship (LGR) of *M. melanops* showed a strong positive correlation coefficient (r) of 0.98 and a 'b' value of 0.75 this was also at its highest in the wet season. The condition factor 'K' was 0.98 (t-test, P>0.05). All fish were considered healthy on the basis of their appearance and absence of obvious signs of disease. From the result of this study, where a comparison was made between the LWR a negative allometric growth pattern was observed ('b'<3) and condition factor of *M. melanops*, there is an indicating that the species does not grow isometrically. Differences in 'b' values and its variations from the ideal '3' can also arise due to variations in habitat, food availability, gonadal maturity, temporal and sampling techniques, fish behaviour for example passive swimmers and evolutionary selection (TESCH 1971; BAGENAL and BRAUM, 1978; WOOTON 1990; JENNINGS and KAISER *et al.*, 2001; KHARAT *et al*., 2008;

MUCHLISIN *et al*., 2010) [37, 38, 4, 45, 23, 28]. MARTIN-SMITH (1996) [26], reported that the regression coefficients for flattened fishes including those within the genus Garra are lower than the other species which often reflects higher variability in the body shape, greater sexual dimorphism, than for heavy-bodied fishes. However, no comparative data for *M. melanops* is available, fishes like the snapper have isometric growth pattern, while *Gymnarchus niloticus*, *Protopterus annectens* and *Polypterus bichir* display negative allometric growth pattern (MUCHLISIN *et al*., 2017; AGBUGUI and ONIYE, 2019 AGBUGUI and ONIYE 2021) [27, 1, 2]. Fulton's condition factor was 0.98 for all fish samples, indicating an excellent condition. Hence, the waters of the River Niger in general are still in good condition and support the healthy fish growth. Since the LWR was observed to be negatively allometric (0.91) the LGR was determined for confirmation and a very strong and positive relationship was obtained. This parameter is used in the design of fishing gears. Though has stated that smaller size populations are not of relevance when considering the LGR because the larger sizes are primarily used for gear selection.

27 males and 42 females were examined with a ratio of 1:1.5. In all of these specimens examined for variety of food items, 33 had empty stomachs while 36 had food items in their stomachs.

The percentage composition of food items obtained from *M. melanops* from November 2019 to October 2020 is shown on Table 2. The spotted suckers feed on a variety of food items. The adult and juveniles do not show feeding specificity though most of the stomachs observed in this study had sand and other detritus materials. Copepods and crabs were the most important of food items with regards to relative importance index (Table 2). These food items can be proven to be naturally preferable to the suckers because of the presence of pharyngeal teeth. The gut is highly specialized to accommodate its food preference. These findings are in agreement with those of PFLIEGER (1975) [33] and WHITE and HAAG (1977) [42].

Table 1: Percentage composition of various food species consumed by *M. melanops*

	%NO	%FO	%W	IRI	%IRI
FISH	07.14	07.86	15.94	0.12	11.54
SCALES	10.32	11.35	8.21	0.09	9.27
CRABS	14.29	14.41	14.01	0.14	14.15
MOLLUSC	10.32	10.04	15.94	0.13	13.13
COPEPODS	13.49	22.71	12.08	0.13	12.78
SHRIMPS	15.08	13.54	12.56	0.14	13.82
SAND	07.94	06.99	10.14	0.09	9.04
DETRITUS	21.43	13.10	11.11	0.16	16.27
TOTAL	100	100	100	1.00	100.00

Key: NO = Numerical method, FO = Frequency of occurrence method, W = Gravimetric method, IRI = Index of relative importance

(IRI): Food item with %IRI > 3 are regarded as primary, > 0.1 to <3 are secondary where as < 0.1 are considered as incidental food items

The Relative Gut Length (RGL) of *M. melanops* was expressed as 0.34. According to BISWASS, (1993) [7], fishes with RGL > 0.6 are carnivorous. The short gut and the type of teeth and pharyngeal teeth is a strong confirmation of its nature of feeding. In *P. annectens*, the short intestine is compensated for by an intestine made up of multiple folds; the *P. bichir* is a carnivorous fish with a short intestine compensated for by the presence of four spiral valves available at the valvular intestine (AGBUGUI and ONIYE 2019; AGBUGUI and ONIYE 2021) [1, 2]. To a large extent, the nature and length of the intestine supports the description of the nature of feeding of a fish species. For isometric species, gut length (GL) must increase as fish length increases which provide capacity of metabolic needs of any given fish (VERIGINIA 1991; KARACHLE and STERGIOU, 2010a) [20, 40]. Presence or absence of stomachs and stomach shape may also influence the length of intestine in addition to body shape and habitat type body mass and structure (GERMAN and HORN, 2006; KARACHLE and STERGIOU, 2010b; BLANCO *et al*., 2016; GURKAN and TASKAVAK, 2017) [14, 21, 8, 17].

The prey–predator relationship of *M. melanops* revealed that fish weight was more related to prey size (Fig 2 and Fig 3). The weight of a prey is often the main factor used to determine the size of a fish species. Fish would take prey sizes according to the size of the body considering the size of the mouth, stomach and gut length. All these parameters ar often dependent and more related to the weight of the fish species in question. In this study it it revealed that predator weight is more related to the size of prey thn its length. Othe authors in agreement with this findings include (OGARI, 1988; BALOGUN 2000; GERMAN and HORN, 2006; BLANCO *et al*., 2016) [31, 5, 14, 8].

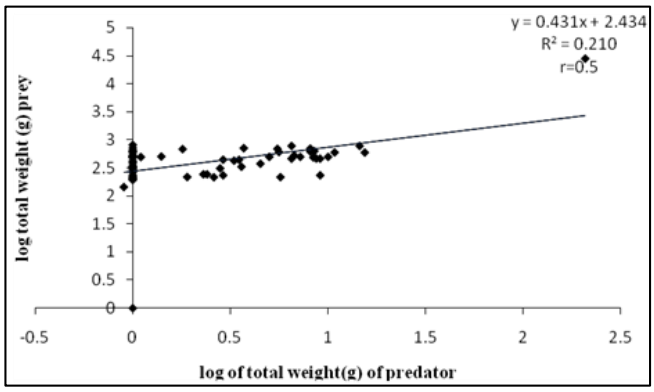

Fig 2: Relationship between prey body weight and total weight of M melanops

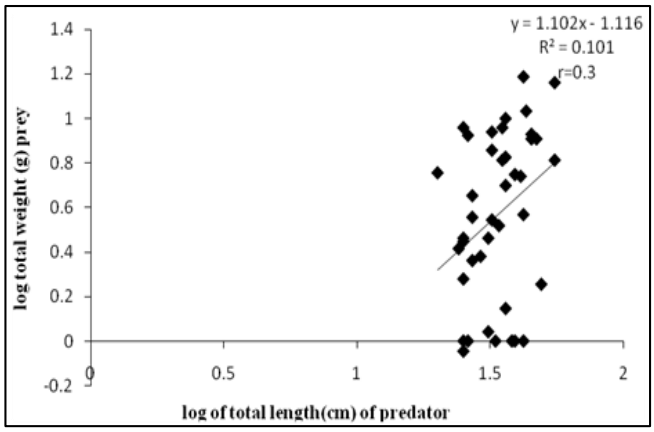

Fig 3: Relationship between prey body weight and total length of *M. melanops*

Five stages of gonad development were found in *M. melanops* during the sample period; the quiescent, maturing, mature and running stages in both males and female fishes (Table 3).

Table 2: Stages of gonad developments observed in *M. melanops*

Gonad stage	Macroscopic character	
	Testis	**Ovaries**
I. Immature	Not encountered	Not encountered
II. Quiescent	Testis were small, opaque in colour	Ovaries were translucent in colour. Oocytes not visible
III. Maturing	Testis were creamy in colour. Blood vessels not visible	Ovaries were pinkish in colour and blood vessels could be seen. Oocytes were visible but could not be counted
IV. Mature	Milt could be released with much pressure	Large eggs were pinkish in colour, oocytes were visible and opaque and could be counted
V. Running	Not encountered	Enlarged eggs are creamy in colour, oocytes very visible and could be counted. Eggs could be released with a little pressure

Females had two ovaries in them and were noticed in fishes with weights from 300g and lengths of 21cm. Ovaries were seen from the months of February (quiescent state), in April and May, maturing stages of egg development were observed. In June, July, August, Mature, and Running stages were observed along the river. Gravid females with high fecundity were also observed in the months of September, October and November. Eggs were hardly visible in December and January. It is observed in this study that the period of egg development synchronized with the onset of the rainy seasons, fecundity was highest at the peaks of the rainy season (September, October and November), these periods reveals spawning periods of the spotted sucker. Therefore changes in Gonadosomatic indices reveals that *M. melanops* have specific maturing, spawning and breeding periods. Fecundity of *M. melanops* was observed to be between 73,275 and 129,732 with a mean value of 92,116 which can be considered as a high fecundity when compared to other low fecund fishes
± 743 eggs.

Conclusion

The findings in this study reveal that *M. melanops* has a small, slim, compressed body with an inferior mouth that is void of teeth, the upper-lip is thick and stocky.
M. melanops exhibits negative allometric pattern *M. melanops* is a carnivore with a preference for Arthropods Females had two ovaries and gravid females with high fecundity observed in the months of September, October and November.
Only one peak of spawning period was observed.
M. melanops is considered a high fecund fish.

Declarations

Ethical Approval and consent to Participate

Not applicable in this section

Consent for publication statement

Not applicable in the section

Availability of data and material

Not applicable in this section

Competing interests

No competing interest.

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Authors' contributions

Dr AMO is the principal researcher, sample collection, analyses, script writer. Dr AO was the research guide and sample director. All authors have read and approved the manuscript, and ensure that this is the case.

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