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## The identity of *Schilbe intermedius* in Jebba Lake, Nigeria

Yem, I. Y. / Bwala, R. L. / Bankole, N. O. /

Kwen, K. / Usman, B. I / Umar, R.

### Abstract

This study attempts to ascertain the identity of *Schilbe intermedius* (Family: Schilbeidae) in Jebba Lake using quantitative (morphometric and meristic) and qualitative (colour and shape) parameters that makes identification easier. 100 specimens were collected and used for the study. There was relationship between body weight and length of fish ( $a=0.039$ ,  $b=2.332$ ,  $r=5.96$ ). The parameters recorded are similar to description of other authors. There is also absence of adipose fin found in the species, which is due to the influence of geographical location.

Keywords: Morphometric, meristic butterfish, Jebba Lake.

### Introduction

Rationale and scientific management of fish according to Ribbink (1991) depends on the fundamental understanding of fish biology and ecology. Taxonomic studies have been going on right from the inception of the century because of its great contribution to management of fishery resources be it in freshwater, brackishwater or marine. Fish identification from any geographical region be it lake, river, floodplain etc is the first step for its proper utilization. Cailliet et al. (1986) reported that a good character is any attribute of an organism that can be detected and used to describe that particular organism. Over 10,000 fish species according to Lundberg et al. (2000) live in freshwater, which makes up about 40% of global fish diversity.

Stiansny (2002) reported taxa of some well-studied fish species. However, to date no comprehensive global analysis from freshwater when compared to those from the terrestrial system (Myers et al., 2000; Olson et al., 2001). Some of this fish species are either not been identified at all, not been properly identified or their names have changed. Omoniyi (1997) have worked on morphometric parameters of *Tilapia zillii*, Njoku and Keke (2002) on that of *Citharinus latus* and Paugy et al. (2003) on *Hydrocynus* spp. and *Tilapia* spp. amongst others. Roberts (2003) reported that numerous fish stocks and species have declined both in abundance and composition. While some have gone extinct, others are threatened and at the verge of disappearing.

The lake harbours the family Schilbeidae that is common and abundant, which play an important role in the commercial fishery of the lake.

This study, therefore, attempts for the first time to ascertain the identity of *Schilbe intermedius* (formerly *Schilbe mystus*) in the lake through analysis of morphometric and meristic features and other peculiar characteristics that makes field identification easy.

### Materials and Method

- **Study area.** Jebba Lake was created after the damming of River Niger in 1983 about 100km below Kainji at Jebba for electricity generation. It is situated between latitudes 9°35' N and 9°50' N and longitudes 4°30' E and 5°00' E. The lake is about 100km long and about 12km at its widest point. The maximum depth is 105m while the mean

depth is about 11 meters. The lake gets the major bulk of its water supply from the discharge of Lake Kainji while tributaries like Rivers Eku, Awun and others also discharge into the lake (Ita et al., 1983).

- **Sample collection.** 100 specimens were collected from gill nets catches of artisanal fishermen for 3 months. Specimen were identified tentatively and transported in ice-chest box to the laboratory for analysis. Care was taken not to damage the fins and other appendages. Specimens were preserved in 5% formalin after analysis for future reference.
- **Body measurements.** Morphometric characters were measured (to the nearest centimeters), taken from the left side of each specimen using dial calipers (Mitutoyo Corporation), meter rule, measuring board and weigh balance. Meristic characters were also evaluated according to Gunther (1966), which includes fin ray counts on dorsal, anal and pectoral, number of gill rakers on the lower region of the gills. Qualitative characters, which include the shape and colour of each specimen, were also considered for the validation.

Validation of the specimen was done by comparing the values of body proportions and meristic counts obtained with standard keys: De Vos (1995) and Paugy et al. (2003). Descriptive statistics and linear regression were used to calculate range, means, standard deviations and coefficient of regression.

**Results and Discussion**

**Table 1: Body measurements of *S. intermedius* in Jebba Lake.**

n = 100			
Parameters	Minimum	Maximum	Mean ± SD
Standard Length (cm)	11.00	14.00	11.92 ± 0.78
Total Length (cm)	14.00	17.00	15.30 ± 0.96
Weight (g)	10.00	30.00	22.89 ± 4.90

**Table 2: Morphometric measurements of *S. intermedius* in Jebba Lake.**

Parameters	Range	Mean ± SD
Body depth	1.4 - 2.6	3.24 ± 0.33
Caudal peduncle depth	1.0 - 1.3	1.11 ± 0.10
Caudal peduncle length	0.7 - 1.6	1.29 ± 0.19
Length of dorsal base	0.6 - 1.0	0.82 ± 0.10
Length of anal base	5.0 - 7.8	5.64 ± 0.60
Length of pectoral fin	1.0 - 2.3	1.64 ± 0.28
Length of pelvic fin	0.9 - 1.7	1.26 ± 0.20
Gape width	0.9 - 1.9	1.13 ± 0.21
Jaw length	0.4 - 0.6	0.51 ± 0.07
Head width	0.9 - 2.0	1.16 ± 0.23
Snout length	0.4 - 1.1	0.62 ± 0.12
Length of longest dorsal spine	1.2 - 2.4	1.77 ± 0.25
Head length	1.7 - 2.8	2.20 ± 0.21

**Table 3: Percentage morphometric and meristic measurements of *S. intermedius* in Jebba Lake,**

Parameters	Range	Mean ± SD
<b>Morphometric</b>		
<b>I. Percentage of standard length</b>		
Body depth	2.9-31.8	26.19± 5.32
Caudal peduncle length	5.0-13.6	10.86 ± 1.65
Length of pectoral fin	1.3-19.2	13.56 ± 3.01

Parameters	Range	Mean $\pm$ SD
Length of pelvic fin	8.2-15.5	10.54 $\pm$ 1.67
Length of longest dorsal spine	10.4-20.9	14.84 $\pm$ 2.05
Head length	14.2-21.7	18.46 $\pm$ 1.46
<b>II. Percentage of head length</b>		
Head width	40.0-71.4	52.54 $\pm$ 7.56
Snout length	18.2-39.3	28.45 $\pm$ 4.51
Length of dorsal base	28.6-52.9	37.60 $\pm$ 5.44
Length of pectoral fin		73.26 $\pm$ 10.62
Length of pelvic fin		
<b>III. Percentage body depth</b>		
Caudal peduncle length	45.0-77.30	57.32 $\pm$ 8.34
<b>IV. Percentage caudal peduncle length</b>		
Caudal peduncle depth	50-108	80.04 $\pm$ 12.41
<b>Meristic</b>		
Dorsal soft fin	1-2	-
Dorsal soft rays	4-6	-
Anal soft rays	63-66	-
Pectoral rays	5-8	-
Total pectoral spine	1	-
Lower gill rakers	8-13	-
Color	Head, dorsal region and sides blackish, silvery or whitish down the belly	

Table 1 shows the body measurements of *S. intermedius* used for the study. Standard and total lengths range between 11.00cm-14.00cm with mean 11.92 $\pm$ 0.78 and 14.00cm-17.00cm with mean 15.3 $\pm$ 0.96 respectively, while the weights range from 10.00g-30.00g with mean 22.89 $\pm$ 4.90. There was no significant difference ( $p > 0.05$ ) in the lengths and weight of the species. Linear regression shows that there is relationship between body weight and length of fish ( $a = 0.038$ ,  $b = 2.3315$ ,  $r = 5.955$ ). Table 2 shows morphometric parameters measured. These include body depth, caudal peduncle length, gape width, length of dorsal base, jaw length, length of anal base, snout length, and head width amongst others. These parameter values did not show any significant difference. Researchers such as Gunther (1966) and Leveque et al. (1990) did report morphometric parameters could be used to establish the identity of fish species.

Body proportions measured (Table 3) shows body depth (2.90-31.80%), caudal peduncle depth (5.00-13.60%), head length (14.20-21.70%), and length of pectoral fin (1.30-19.20%) as percentage of standard length. In the case of percentage head length as it relates to other parameters, head width is (40.00-71.40%), snout length (18.20-39.30%), length of pelvic fin (45.00-77.30%); percentage body depth to caudal peduncle length (31.40-53.80%) and percentage caudal peduncle length (50-108%) to caudal peduncle depth.

Meristic attributes (Table 3) shows that the dorsal region has, single spine, 1-2 soft fins and 4-6 soft rays. Similarly, Paugy et al. (2003) did report pectoral rays between 5-8 with a single spine. Idodo-Umeh (2003) reported *Schilbe intermedius* having 41-66 branched rays on anal fin, dorsal fin with spine and 5 branched rays, absence of adipose fin, caudal fin forked and bends downward. Paugy et al. (2003) reported 41-66 anal fins, whereas 63-66 was reported in this study, which is within the range. De Vos (1995) did report that the number of anal fins varies with geographical origin of specimen. The lower part of the first branchial arc has 8-13 gill rakers (Table 3). Similar observation was also reported by Idodo-Umeh (2003).

The body colouration shows that the head, dorsal region and sides are blackish, which tends to become silvery or whitish down to the belly. There is also a prominent dark spot just after the operculum on both sides of the fish, absence of adipose fin or tissue, the snout is not prominent as in the case of *Schilbe mystus* and the caudal fin bends downward. The head and back according to Paugy et al. (2003) are dark brown with two brownish or blackish bands on the sides, one along the lateral line and another above anal fin base. As the species grows the color pattern fades: the head and back remains brownish while the bands on the lateral line fades and the sides become more or less whitish or silvery. Idodo-Umeh (2003) reported the species having grayish-brown back, sides and belly silvery white and a large spot below the operculum.

## Conclusion

The results show that most of the morphometric attributes of *S. intermedius* is similar to previous description of other authors except for geographical influence on some attributes (adipose fin or its rudimentary) which makes it peculiar.

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