

THE HEAD- BODY WEIGHT AND HEAD-BODY LENGTH
RELATIONSHIP OF *SYNODONTIS SCHALL* (BLOCH AND SCHNEIDER 1801) IN ASA LAKE,
ILORIN, NIGERIA.

BY

P. A. ARAOYE
DEPARTMENT OF ZOOLOGY
UNIVERSITY OF ILORIN
P.O.BOX 5565, ILORIN
ILORIN, NIGERIA.
Email: paraoye@skannet.com

ABSTRACT

A total of 710 specimens of *Synodontis schall* were analyzed for the head body weight and head body length relationship. The head constituted 40% of the total body weight and 30% of the total body length. The mean head weight for male and female computed was 23.90 g and 29.13 g respectively. Head weight in both male and female was significantly different ($P < 0.01$) while the head length for the combined sexes showed no significant difference ($P > 0.05$). Fat accumulation in the body tissue was prominent in the females than males usually before the breeding season. The significance of the cephalo-nuchal shield in the bony head of *Synodontis* species compared with some other catfishes in the lake was also discussed.

Key words: Head, *Synodontis schall*, Cephalo-nuchal shield.

INTRODUCTION

The genus *Synodontis* is of great commercial importance (Read *et al.*, 1967; Olatunde, 1989) and their presence in many tropical water bodies have been reported by many authors including Bishai and Gideiri, 1965 a; Petr, 1967; Poll, 1971; Fagade, 1983; Olatunde, 1989. *Synodontis* are highly relished in Ilorin and environ because of its bony head and fleshy body which usually attract lovers of the popular "pepper soup". They are partially armored because of a well-developed cephalo-nuchal shield on top and side of the head, and the strong bony spine of the dorsal and pectoral fins.

There are many literature on the biology of this genus including those of Bishai and Gideiri, 1965 b; Willoughby, 1974; Oni *et al.*, 1983. Information on the proportion of the bony head constituting the total body weight and length is lacking. This work is aimed at determining body-head weight and body-head length relationships of the fish to compare the proportion of the available bony head with the body flesh.

MATERIALS AND METHODS

Bi-monthly collections of *S. schall* from fishermen in Asa lake Ilorin was carried out from January to December 2002 and specimens were brought to the laboratory in an ice container. Sexes were differentiated after opening the viscera cavity to observe the gonads. The total length of each specimen was taken using a meter ruler, while the body and gutted weights were also determined using a top loading metler balance. Each specimen was allotted a serial number. The head was later separated from the body using a sharp knife to cut from the origin of the dorsal spine vertically to the ventral surface of the fish. The head weight and length were also determined and recorded similarly. Male and female head weight and length were compared

statistically with t-test analysis. Also the percentage head weight and length of the total body weight and length were computed and compared for both males and females.

RESULT

A total of 710 specimens were used for the analysis. The head weight and body weight relationship was positively correlated (0.98). T-test analysis (Table 1) also showed significant difference in head weight between male and female ($P < 0.01$). Mean head weight computed for males and females include 23.90 g and 29.13 g respectively. Fat accumulation around the body tissue was more prominent in females than males usually before the breeding season. The proportion of the head weight constituting the total body weight was 40%. The relationship between head length and total length of fish was also positively correlated (0.85). Mean head length computed in males and females include 5.16 cm and 5.26cm respectively. Head length in both males and females (Table 2) showed no significant difference ($P > 0.05$) and also constituted 30% of the total body length.

DISCUSSION

The positive correlation between body weight and head weight, body length and head length shows that the head weight and length increased with body weight and length. This is sequel to the growth rate of *S. schall* which has been described to be isometric (Willoughby, 1974; Olatunde, 1989 Araoye, 1997). Higher values of the head weight in females than in males can be attributed to the fat accumulation that was more prominent in females than males because there was no significant difference in the head length between both sexes. The percentage head weight (40%) and head length (30%) of the total body weight and length respectively is an indication that the bony head contributed substantially to the total body parts of the fish.

Synodontis are peculiar in that they are partially armored because all members of this genus possess a well developed cephalo-nuchal shield on the top and side of the head, and strong bony spines on the dorsal and pectoral fins. This probably helps to reduce predation on them by piscivorous fishes. The amount of bone present in the body probably may be greater than in other cat fishes and consequently the forces produced by the swim bladder must be greater if neutral buoyancy is to be achieved (Willoughby, 1976). Alexander (1959 a) reported that the average dry bone content of fresh water fishes was approximately 7.0% of the body weight. Although the result of this work cannot be compared with that of Alexander (1959 a) since it does not involve the use of dry bone however, it is established that the presence of cephalo-nuchal shield could have contributed significantly to the total quantity of bone in *S. schall* unlike some other cat fishes in the same lake such as *Chrysichthys nigrodigitatus* and *Clarias lazera* in which the head constituted 20.10 % and 21.40 % of the total body weight respectively (personal observation).

ACKNOWLEDGEMENT

I thank the fishermen in Asa lake particularly Mallam Musa and Mallam Sani for providing the fish.

REFERENCE

- Alexander, R. McN(1959 a). The physical properties of the swim bladder in intact Cypriniformes. *J. exp. Biol.* 36: 315-322.
- Bishai, H.M. and Abu Gideiri, Y. B. (1965 a). Studies on the biology of the genus *Synodontis* at Khartoum I. Age and growth. *Hydrobiologia*, 26:85-97.
- Bishai, H. M. and Abu . Y. B. (1965 b). Studies on the biology of the genus *Synodontis* at Khartoum II. Food and feeding habits. *Hydrobiologia*, 26:78-113.
- Fagade, S. O. (1983). The food and feeding habits of the fishes of Lower River Benue, Nigeria. *Bulletin de l'I.F.A.N.* T. 45, Ser. A. No, 3-4.
- Olatunde, A. A. (1989). Some aspects of the biology of *Synodontis schall* (Bloch and Schneider) in Zaria. *Nigeria Journal of Aquatic Sciences* 4: 49-54.
- Oni, S. K., Olayemi, J. Y. and Adegboye, J.D. (1983). Comparative Physiology of three ecologically distinct fresh water fishes, *Alestes nurse*, (Ruppell) *Synodontis schall* (Bloch and Schneider) and *Tilapia zilli* (Gervais). *J. Fish. Biol.* 22: 105-109.
- Petr, T. (1971). Food preference of commercial Fishes in the Volta lake. Volta Basin Research Project. Univ. of Ghana. Technical Report. X22.
- Poll, M. (1971). A revision of the African *Synodontis*. *Annis. Mus. R. Afr. Cent.* No. 191: 1-497.
- Reed, W.; Burchard, J.; Hopson, A.J.; Jenness, J and Yaro, I. (1967). Fish and Fisheries of Northern Nigeria. 1st Ed. Pub. M.A.N.R. 226 pp.
- Willoughby, N.G. (1974). The ecology of the genus *Synodontis* (Pisces: Siluroidei) in Lake Kainji, Nigeria. Ph.D. Thesis. Univ. of Southampton. 288pp.
- Willoughby, N.G. (1976). The buoyancy and orientation of the upside-down cat fishes of the genus *Synodontis* (Pisces: Siluroidei). *J. Zool. Lond.* 180. 291-314.

TABLE 1

Difference in head weight male and female *Synodontis schall* (t value)

Sex	N	Mean	Variance	t value
Male	322	23.90	149.20	4.59
Female	388	29.13	321.90	

** Significant at 0.01

Critical value at infinity = 2.236

TABLE 2

Difference in head length male and female *Synodontis schall* (t value)

Sex	N	Mean	Variance	t value
Male	322	5.16	0.60	1.49
Female	388	5.26	1.00	

** Significant at 0.05

Critical value at infinity = 1.65