

Length-Weight Relationships of the Mudskipper *Periophthalmus barbarus* in the Imo River Estuary, Nigeria

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Abstract

The length-weight relationships, by sexes, and combined, and monthly condition factors of the mudskipper *Periophthalmus barbarus* are presented, based on 1 079 specimens ranging from 1.6 to 15.6 cm (TL) sampled from April 1993 to March 1994 near the mouth of the Imo River, Nigeria.

Introduction

The present contribution examines the temporal (monthly and seasonal) and intersexual dynamics in the parameters of length-weight relationships of the mudskipper, *Periophthalmus barbarus* (Linné, 1766) in the estuary of the Imo River, Nigeria.

The Imo River basin is located in the tropical rainforest belt with an equatorial climatic regime typified by dry (November-April) and wet (May-October) seasons. Detailed descriptions of the hydrometeorological conditions in the study area are contained in ENPLAN GROUP (1974).

Materials and Methods

Monthly samples of *P. barbarus* were obtained from the intertidal saline swamp of Imo River estuary at Ikot Abasi from April 1993 to March 1994, using unbaited conical valved basket traps. Each specimen was sexed (the genital papilla are larger in males than in females), measured (total length, cm) and weighed (total weight, g) after draining excess water from the buccal cavity and blot-drying.

The length-weight relationships were established using ordinary linear regression, applied to the log-transformed lengths and weights. Also, condition factors were calculated, defined as $cf = W \cdot 100/L^3$ (Carlander 1969).

Results and Discussion

The overall length-weight relationship for the female fish, ranging from 1.3 to 13.6 cm ($r = 0.972$, $n = 622$, $P < 0.001$) was:

$$W = 0.0111 L^{3.013}$$

This indicates a nearly isometric relationship, with 94.5% of the variation in body weight being accounted for by changes in length.

The corresponding relationship for male *P. barbarus* ranging from 3.3 to 15.6 cm ($r = 0.990$, $n = 457$, $P < 0.001$) was:

$$W = 0.0093 L^{3.084}$$

Here again, weight increased nearly isometrically with fish length, and 98% of the variation in body weight was explained by changes in length.

Since there were no significant intersexual differences in the L/W regression parameters of *P. barbarus*, the data were pooled, leading the general relationship ($r = 0.921$, $n = 1079$, $P < 0.001$) was:

$$W = 0.1533 L^{2.902}$$

which accounted for 84.8% of the variance in the data.

Table 1 shows the monthly trends in the condition factors of male and female fishes. Overall mean condition of female *P. barbarus* was 1.01 ± 0.31 , and varied from 0.48 during the onset of the rains (May) to 1.48 during the peak of the dry season (January). Average condition for the dry season (1.24 ± 0.23) significantly exceeded the wet season value (0.79 ± 0.18) ($t = 3.445$, $df = 10$, $P < 0.01$). However, intraseason variability in condition factor for the dry (C.V. = 18.6%) and wet (C.V. = 22.8%) seasons were not significantly different ($F = 1.633$, $P > 0.05$).

Male condition factors ranged from 0.65 (May, November) to 2.51 (March), with a gross average of c.f. = 1.19 ± 0.57 . Average condition factors for the dry (1.32 ± 0.69) and wet (1.06 ± 0.44) seasons were not significantly different ($t = 0.710$, $df = 10$, $P > 0.05$). Similarly, intraseason variability for the dry (C.V. = 52.3%) and wet (C.V. = 41.5%) seasons were not significantly different ($F = 2.459$, $P > 0.05$).

Table 1. Monthly variation in the condition factor (c.f. = $W \cdot 100/L^3$) of female and male *P. barbarus* in the estuary of the Imo River, Nigeria.

Month	Female	Male
April (1993)	0.93	0.89
May	0.48	0.65
June	0.85	0.66
July	0.92	1.25
August	0.67	1.03
September	0.92	0.93
October	0.90	1.81
November	1.19	0.65
December	1.00	0.84
January	1.48	1.60
February	1.37	1.43
March (1994)	1.44	2.51

References

- Carlander, K. 1969. Handbook of freshwater fishery biology. Vol. I. Iowa State University Press, Ames.
 ENPLAN GROUP. 1974. Imo River Basin Pre-feasibility Report. Vol. II. Fed. Min. Agric. Lagos, Nigeria.

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