

## **STUDY ON GROWTH AND CONDITION FACTOR OF *OREOCHROMIS MOSSAMBICUS* IN MALIR RIVER**

**Syeda Nazneen Rizvi, Farida Bano and Sumera Farooq**

Department of Zoology, University of Karachi.

**ABSTRACT:** The present study was conducted to examine the extent of pollution in Malir River by studying the growth of *Oreochromis mossambicus*, the common fish of this river. In this study, analysis of length and weight has been done to describe the variation in growth and condition index. The growth rate (Best Condition Factor) was observed at spot 3 (Drigh road) and low at spot 4 (Quyumabad).

**KEY WORD:** *Oreochromis mossambicus*, growth, condition factor, Malir River.

### **INTRODUCTION**

Measurement of body length gives direct evidence for growth or lack of growth. Fisher were reported to shrink during starvation (Busacker *et al.*, 1990). Change in body weight is probably the most common procedure for the assessment of the whole growth of fish. According to some scientists like Ebert (1973) Anderson and Gutreuter (1983), a change in weight is a very clear indicator of growth compared to the variation in length. Changes in weight are relatively greater than changes in length with the growth of the fish. In addition to these two variables of growth, condition factor is also used to describe either the condition or fatness or well being of a fish (Bagenal, 1978 and Lloyed, 1992).

In this paper the growth of *Oreochromis mossambicus* in Malir River was evaluated and discussed.

### **MATERIALS AND METHODS**

*Oreochromis mossambicus*, the most common fish of Malir River, was selected as a sample species to evaluate the effects of pollution on fish fauna. Groups of 20 fishes, as recommended by Novotny and Beeman (1990) and Biswas (1993), were captured monthly by hand net from four spots (1-4) in Malir river. Spot 1 Murad Memon Goth, spot 2 Malir City, spot 3 is Drigh road and spot 4 is located at Quyumabad. Length and weight of specimens captured from each spot were measured by the procedures given by Bagenal (1978). The growth variables were recorded up to a period of three years and expended as condition factor 'k'.

### **RESULTS**

During this study, length of *Oreochromis mossambicus* was found generally to vary between 19.77 - 36.11 cm at spot 1 while at spot 2 it showed variation of 19.27 - 30.80 cm. The average length at spot 1 and 2 ranged between 28.13 - 29.1 cm and 23.45 - 27.69 cm respectively (Table 1). The weight of *O. mossambicus* vary between 150 - 642.5 gm and 117.5 - 300.0 gm at spot 1 and spot 2 respectively.

The length of *O. mossambicus* varied between 20.25 - 38.88 cm, at spot 3 while at spot 4 it showed a variation of 18.92 - 28.16 cm (Figure 1 & 2). Lengthwise better specimens were observed at spot 3. (Figure 1). Minimum average length was measured in the specimens of spot 4 (Table 1). Similar to the data of length, comparatively the heaviest specimens were observed at spot 3. Where the weight of fishes fluctuated throughout the study between 192.5 to 842.5 gm (Figures 1 & 2).

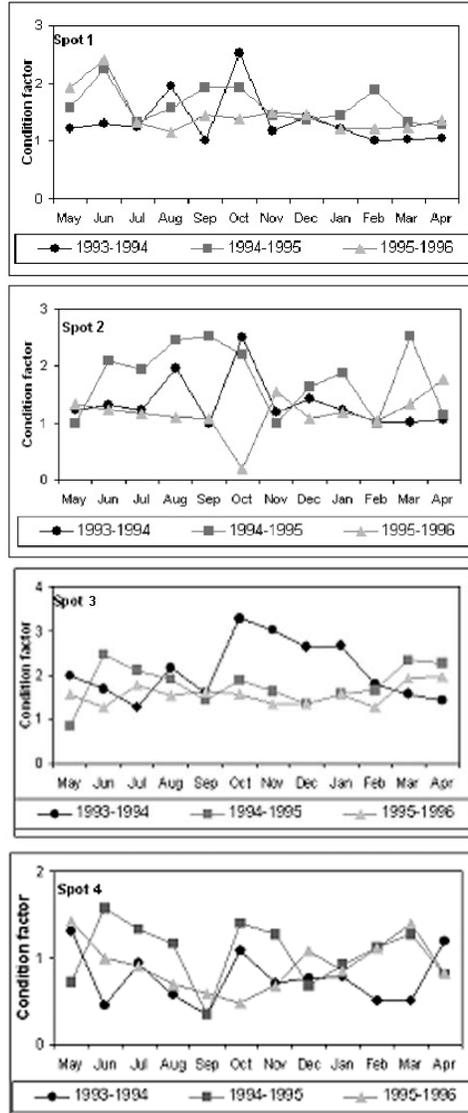


Fig. 1. Variation in condition factor at Spot 1-4 in Malir River.

**Table 1. Average length and weight of *O. mossambicus* during 1993 to 1996 at spot 4 and spot 5.**

Average Length and Weight			
	1993-1994	1994-1995	1995-1996
<b>Spot 1 Length</b>	36.11±24.71	32.51±26.06	30.67±19.77
<b>Weight</b>	642.5±242.5	642.5±242.5	392.5±150.0
<b>Spot 2 Length</b>	30.6±22.65	30.80±19.27	30.60±21.59
<b>Weight</b>	300.0±222.5	292.5±117.5	300.0±117.5
<b>Spot 3 Length</b>	38.88±24.71	38.88±20.25	38.88±25.55
<b>Weight</b>	842.5±242.5	842.5±192.5	742.5±292.5
<b>Spot 4 Length</b>	26.06±19.98	28.16±18.92	24.94±18.92
<b>Weight</b>	131.5±59.1	106.8±77.2	100.1±74.5

Study of condition factor also revealed the best condition of fishes at spot 3 ( $K=2.23$ ) during 1993 - 1994. While the worst condition was observed in the specimens of spot 4 ( $K=0.43$ ) (Figures 1 & 2).

## DISCUSSION

Fishes are now considered as the best indicators of the environment quality criteria (William, 1995). Fishery scientists also use condition factor of fish as a simple indication to test the suitability of an environment (Le Cren, 1951). The present study was also conducted to estimate the extent of pollution in Malir River by comparing length, weight and condition factor of *Oreochromis mossambicus* at spots 3 and 4. Several factors such as food and environmental conditions were reported to influence growth and condition factor “K” (Le Cren, 1951; Salam and Mahmood, 1993).

The data showed that the growth of fishes was good at spot 3 as compared to spot 4. Spot 4 of lower Malir river was reported to be more polluted as compare to spot 3 (Bano *et al.*, 2009). This spot is also reported to have high levels of ammonium (Bano *et al.*, 2009) which is toxic to aquatic life (Chapman and Kimstach, 1996). The data reflect the condition of aquatic life in Malir river and hence can be used in the management of pollution in this important river in future.

## REFERENCES

- Anderson, R.O. and S.J. Gutreuter, 1983. Length, weight and Associated Structural Indices. In: Nielsen, L.A. and Johnson, D.L. (Eds.) *Fisheries techniques*. American Fisheries Society, Bethesda, Maryland, PP. 283-300.
- Chapman, D. and V. Kimstach, 1996. Selection of water quality variables. In: *Water quality Assessments* (D. Chapman ed). Chapman and Hall, London, PP. 59-126.

- Bagenal, T.B. (Ed.), 1978. *Method for Assessment of Fish Production in Freshwaters*, 3<sup>rd</sup> edition Blackwell Scientific Publications, Oxford, 1-365.
- Bano, F., S.N. Rizvi, F. Begum, and S. Farooq 2009. Assessment of water quality for the determination of extent of pollution in Malir river. *Int. J. Biol. Biotech.* 6(1-2): 61-66.
- Biswas, S.P. 1993. *Manual of Methods in Fish Biology*, South Asian Publishers Pvt. Ltd., New Delhi, ISBN – 81-7003-158-3 (SAP).
- Busacker, G.P., I.R. Adelman and E.M. Goolish, 1990. Growth In: Schreck, C.B. and Moyl, P.B. (Eds) *Methods for fish biology*. American Fishery Soc., USA, PP. 363-387.
- Ebert, T.A. 1973. Estimating growth and mortality rates from size data. *Oecologia* (Berlin), 11: 281-298.
- Lecren, E.D. 1951. The length-weight relationship and seasonal cycle in gonad weight and condition in the perch (*Peraflav escens*), *J. Anim. Ecol.*, 20: 201-219.
- Lloyd, R. 1992. *Pollution and Freshwater Fish*. Fishing News Books. The Buckland Foundation, PP. 23-32.
- Novotny, J.F. and J.W. Beeman, 1990. Use of a fish health condition profile in assessing the health and condition of Juvenile Chinook Salmon. *The progressive fish culturist*, 52: 162-170.
- Salam, A. and J.A. Mahmood, 1993. Weight-length and condition factor relationship of a freshwater under yearling wild catla catla (Hamilton) from river chanab (Multan). *Pakistan Journal of Marine Sciences; Journal of Marine Sciences J. Zool.*, 25(2): 127-130.
- William, A.N. 1995. Encyclopedia of Environmental Biology Academic Press, New York, 2: 417.