Relative Condition Factor of Feather Back, *Notopterus Notopterus* (Pallas) from Jannapura Pond, Bhadravathi Taluk , Karnataka

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ABSTRACT

This study deals with the relative condition factor of feather back fish *Notopterus notopterus* (Pallas) in Jannapura pond, Karnataka. The fish specimens were collected during the period August 2002 to July 2003 and the total length and weight of both the sexes of fishes were recorded. The mean relative condition factor showed seasonal variation in both sexes. The mean relative condition factor value was found to be highest in April & lowest in December for both the sexes. The reduction in the Relative condition factor (Kn) during spawning phase may be because of the fish becoming exhausted due to spawning activity. The condition of the fish was coincided with the maturation stage of the fish. The mean Kn values for different months and length groups indicated good conditions of the fishes.
Keywords: Relative Condition Factor, *Notopterus notopterus* (Pallas), Jannapura Pond, Spawning

I. INTRODUCTION

Feather backs have slender, elongated, bodies, giving them a knife-like appearance. The caudal fin is small and fused with the anal fin, which runs most of the length of the body. Where present, the dorsal fin is small and narrow, giving rise to the common name of "featherback". The fish swims by holding its body rigid and rippling the anal fin to propel itself forward or backwards (Greenwood & Wilson, 1998; en. wikipedia.org). Feather-back, *Notopterus. notopterus* has a widespread distribution and is commonly found in ponds, tanks, reservoirs and rivers of Malnad region of Karnataka. *Notopterus. Notopterus* included under the class- Actinopterygii and order-Osteoglassiformes and belongs to the family Notopteridae. This fish found abundantly in Jannapura pond during 2002-03 and it has high economic value and considerable fishery importance.

The Relative condition factor has been widely used as it indicates suitability of the environment for fish growth. The relative condition factor (Kn) is important in understanding their nutritional and biological cycles in fishes (Le Cren, 1951; Pandey and Sharma, 1997). Le Cren (1951) has suggested relative condition factor (Kn)

to estimate the effect of length and other factors such as age, sex, maturity, feeding intensity, selection in sampling etc., on Kn. Tester (1940) and Kesteven (1947) have discussed their importance in studies on condition factor. Variations in the condition factor have been attributed to different environmental factors in case of different fisheries by Hickling (1945), Qasim (1957) and Black burn (1960).

The relative condition factor is used to know the variation between the observed and expected weight of fishes (Kund et al., 2011; Mohanty et al., 2014). Hence, an attempt has been made to estimate the Relative condition factor (Kn) of *Notopterus notopterus* (Pallas) harvested from Jannapura pond, Karnataka. Such data is very helpful in understanding the fish biology of this species and sustainable management of fishery resources.

II. METHODS AND MATERIAL

A. Study area

Jannapura pond is situated near Bhadravathi town in Shimoga district of Karnataka (13 48'37"- o o o 13 52'30"N & 75 40'42"-75 43'33"E). This water body is perennial one and receives the water from Bhadra left bank channel as well as rain water. The pond covering

an area of 20 ha and depth of about 5- 10m. The pond water is utilised for irrigation and fish culture.

Fishes were collected monthly during August 2002 to July 2003 from Jannapura pond, Karnataka. A total of 180 species ranging from 100 mm to 340 mm in total length were utilized for the computation of condition factor. The measurements were taken on a fish measuring board upto the nearest millimeters and corresponding weights on a monopan balance to the nearest gram.

The data used for length-weight relationship were also utilized for calculating the relative condition factor. The relative condition factor, K_n (Le Cren, 1951) was calculated for different months by making use of the formula

$$K_n = \frac{W}{\hat{W}}$$

Where, W = observed weight, ^W = estimated weight. In order to find out the relation, if any, between spawning season and relative condition factor, monthly mean values of K_n were calculated separately for two sexes. The weighted average of relative condition factor was also calculated for the whole period under study for male and female fish.

III. RESULTS AND DISCUSSION

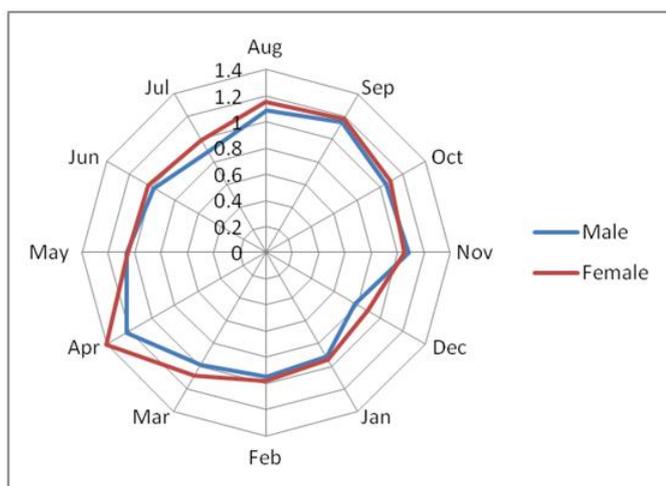### Monthly Fluctuation in Relative Condition Factor

Figure 1: Radar diagram showing monthly variations in the values of Kn of *Notopterus notopterus*

Figure 1 represents the monthly averages of the relative condition factor for males and females during 2002-03. The lowest K_n value for male was in December 2002 (0.750) and the highest K_n value in April 2003 (1.22). Similarly, for females, the highest K_n value for female was in April 2003 (1.4) and the lowest in December 2002 with 0.89. With the advent of monsoon in June, Kn values showed an decreasing trend in both the sexes.

Fluctuation in Kn in Relation to Length of Fish

The fishes were divided into different length groups for determining the condition index. It may be seen that the pooled *Kn* of the· two' sexes is higher in the case of smaller' and larger fishes and lower in case of medium size group fishes (Figure 2).
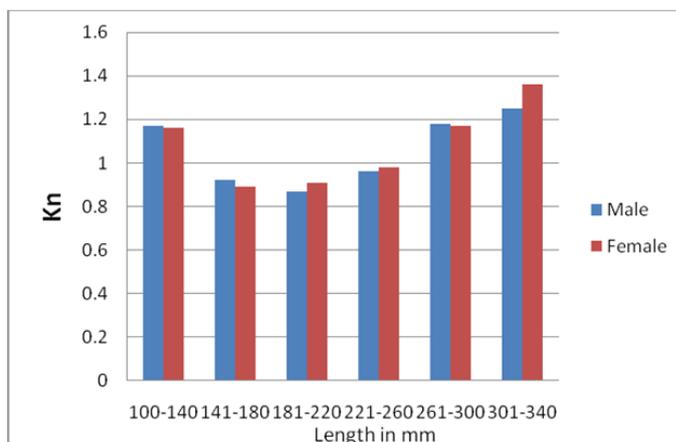

Figure 2 : Average Kn values for male and female *Notopterus notopterus* at different size groups

Discussion

Le Cren (1951) proposed the relative condition factor in preference to condition factor as the latter is influenced by many environmental and biological factors. Condition factor measures the deviation from a hypothetical ideal fish whereas relative condition factor measures the deviation from the average weight or length of fish. Various biological factors such as fatness, gonadal development, feeding and other environmental factor lead to fluctuations in the condition factor. Evaluation of the conditions at different body lengths can give valuable information regarding the maturation and spawning in the life span of the fish, whereas a close look at condition at different months can give definite clues regarding the breeding seasons (http://shodhganga.inflibnet.ac.in/bitstream).

The present study on the seasonal variation in the condition of males and females showed that the 'K$_n$' values are more or less similar in both the sexes thus indicating almost equal metabolic activity. The higher values of K$_n$ observed during the present study may be due to the developed gonads and breeding season and the lower K$_n$ value due to spawning and poor to moderate feeding.

Kurup and Samuel (1984) reported the relative condition factor of *Gerres filamentous* in Vembanad lake. According to them, the relative condition factor synchronises mainly with the spawning cycle. EL-Agamy (1988) reported the relative condition factor of *Gerres oyena* in Arabian Gulf waters. He stated that the condition factor changes with weather condition and maturity of gonad. Singh (1989) reported that in *Gerres filamentosus* the variations in the condition factor are related to sexual cycle, intake of food and perhaps other factors. Choudhury et al. (1990) found that in *Hilsa ilisha* the seasonal variations in the relative condition indicate an increase from March reaching the peak during May. This may be due to development of gonads. Spawning might have resulted a fall in the relative condition of the fish during June. In *Notopterus notopterus* high values during summer may be again due to development of gonads.

Bhatta (1970) reported that the condition factor decreases with an increase in length and increases with feeding. The low value of *Kn* in 141-260 mm groups is due to onset of sexual maturity. The fluctuations in *Kn* values related to increase in length of fish have been used by several workers (Verghese, 1973; Khan, 2003) as a sign of attainment of sexual maturity.

The values of condition factor in *Ompok bimaculatus* exhibited upward trend during February to April but manifested on abrupt fall during April to June (Maturity period). However, the low values of condition factor during breeding season (June to August) are more attributed to the restricted and erratic feeding activities than to the spawning stress (Bhimasena Rao and Karamachandani, 1986). Further, Reddy and Rao (1992) in case of *Puntius sophore* attributed the higher K$_n$ values, the occurrence of breeding season that have an effect on the relative condition of fish. The relative condition factor being one or closer to one indicates, the good condition of fish. In addition, the value of the relative condition factor being closer to and greater than one in both the sexes suggested the overall suitability and wellbeing of *Notopterus notopterus* in Jannapura pond.

George et al.(1985) reported that Kn indicates the general well-being of the fish. If the values of Kn greater than1 (> 1) indicates that the wellbeing of the fish is good whereas, its value less than 1 reflects that the wellbeing of the fish is not in a good condition. It can be suggested from the present study that the well-being of the fish was good at Jannapura pond population as the Kn values was recorded to be closer and greater than 1. Higher value of Kn may be due to several reasons such as feeding intensity, maturity, breeding cycle or environmental factor (Shafi and Quddus, 1974; Manorama and Ramanujam, 2014.) and the decline in Kn values could have been caused by the dominance of larger specimens in the samples and also by the spent gonads (Masud and Singh, 2011; Manorama and Ramanujam ,2014). The seasonal fluctuations in the relative condition factor of both the sexes could be attributed to the seasonal sexual cycle, spawning and intake of food

IV. CONCLUSION

The monthly fluctuations in the condition factor were found to be related to the maturation cycle, spawning and intake of food in fishes. From the present findings, it can be concluded that the population of *N. notopterus* is under exploitation level at Jannapura pond. Therefore, protection from over exploitation, non-allowable mesh size gears/nets, banning of fishing during the breeding season is recommended, which in turn will help to manage this fishery in a sustainable way.

V. REFERENCES

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