



GONADO-SOMATIC INDEX OF FRESH WATER FEATHER BACK, *NOTOPTERUS NOTOPTERUS* (PALLAS) FROM JANNAPURA POND, KARNATAKA

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Cite This Article: Dr. K. Harish Kumar & Dr. B. R. Kiran, "Gonado-Somatic Index of Fresh Water Feather Back, *Notopterus notopterus* (Pallas) from Jannapura Pond, Karnataka", International Journal of Applied and Advanced Scientific Research, Volume 2, Issue 1, Page Number 11-13, 2017.

Abstract:

This study deals with the Gonado-somatic index 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 Gonado-Somatic index value was found to be highest in May & lowest in October for both the sexes. The mean GSI values for different months indicated good conditions of the fishes. Gonado-somatic index values of fish showed an increasing trend during maturity and abruptly falls after spawning.

Key Words: Gonado-Somatic Index, *Notopterus notopterus* (Pallas), Jannapura Pond, Maturation & Spawning

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 "feather back". 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-Osteoglossiformes 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.

Due to over population and industrialization availability of agriculture land is reducing day by day. Moreover in a developing country like India where 30% of population is still suffering severely by malnutrition and health hazards fish food may be useful tool to provide proteinaceous and easily digestible food item. The scientific management for obtaining high yield of fish production eventually calls the adequate and in-depth study of breeding mechanism (Ashwini G Ghanbahadur et al., 2013). The present study was undertaken to know accurately spawning period of *Notopterus notopterus*. This is reported in terms of gonado-somatic index which express the relative change in gonad weight to the percentage of body weight.

Materials and Methods:

Study Area:

Jannapura pond is situated near Bhadravathi town in Shivamogga district of Karnataka (Figure 1) (13° 48'37"- 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- 10 m. The pond water is utilised for irrigation and fish culture.

Gonado-Somatic Index (GSI):

The weight of the individual fish was noted and the male and female fish gonads were removed carefully and weighed in a monopan balance after removing the excess of moisture using a blotting paper. The method of June (1953) and Yuen (1955) was employed to calculate the percentage gonad weight or gonado-somatic index by using the formula, gonado-somatic index

$$GSI = \frac{\text{Weight of gonad}}{\text{Weight of fish}} * 100$$

The average values of GSI were plotted against months for males and females separately.

Results and Discussion:

The percentage gonad weight in total weight, also termed as the gonado-somatic index (GSI), was calculated for each month. The results are tabulated in Figure 2. On plotting the average relative gonad weight against months, resulted in a monthly change in gonado-somatic index of males and females. The gonado-somatic index (Fig.1), which indicates the state of gonadal development and maturity, showed a sudden rise in GSI value during May in both the sexes of feather back. This was maintained during June, with a slight decline in June and a sudden fall in July. From October onwards it gradually increases.

From the above observations, it is quite evident that the highest values of GSI were obtained in May for males and females during the study period. Here, the highest value of GSI indicates the peak occurrence of mature individuals of *Notopterus notopterus*. Recently, peak values of GSI in female *Silonia childreni* were

recorded by Vinci (1984) and highest values of GSI in female *Barilius barana* were recorded during June and July by Dobriyal et al. (2000). Johal et al. (2000) recorded the highest values of GSI in female *Cyprinus carpio* during June coinciding with the peak breeding season from Gobind sagar (Himachal Pradesh) reservoir.

Sivakami (1982) recorded peak values of GSI during February, June and November, also coinciding with occurrence of increased percentage of the mature females during these months, thereby suggesting that the breeding is more intense during these months in *Puntius dorsalis*. However, Bhimasena Rao and Karamchandani (1986) opined that low values of GSI in *Ompok bimaculatus* suggesting the ovaries to be in resting and maturing stages and higher values of GSI indicating the ovaries to be in maturing, mature and ripe stages. Bhatt and Pathak (1992) have recorded that the GSI increases from June to September for the *Putor mahseer* collected from Sarju (Kumaun) which may be due to small sized mahseer (Immature) collection only from limited sites of Sarju. The monthly and seasonal fluctuations of GSI in relation to spawning season of the fish have also been recorded by Piska and Waghary (1986) and Dobriyal and Singh (1987). The gonado-somatic index studies have given important indications on the spawning of *Notopterus notopterus*. The pattern of fluctuations in the gonado-somatic index are identical in both female and male fishes.

Gonads undergo regular seasonal cyclical changes in weight especially in females (Neelakantan, et al., 1989). Such changes are indicative of the spawning season (Qasim, 1973). The gonadosomatic index indicates the state of gonadal development and maturity. A number of workers have used the GSI for variety of fishes (Gonad weight expressed as a percentage of total body weight) as a tool to establish the breeding period and reliable measure of gonadal state (Saxena, 1986; Karatas and Toglaci, 1999; Sathish and Kulkarni, 2014). The present data on the GSI of both the sexes of fish *N. notopterus* studied showed an increase trend in the month of May. Thus pattern of change in GSI reported in other Indian fishes such as *H. fossilis* (Verma et al., 1985). *Wallago attu*, *Mastacembalus armatus* (Saxena, 1986). The GSI values of both male and female *N. notopterus* shows an increase and decrease during the months of active gonadal activity.

Conclusion:

The monthly fluctuations in the GSI were found to be related to the maturity and gonadal development 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 will help to manage this fishery in a sustainable way.

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Figure 1: Location of the Study area (Source: <https://ellakavi.files.wordpress.com/2007>)

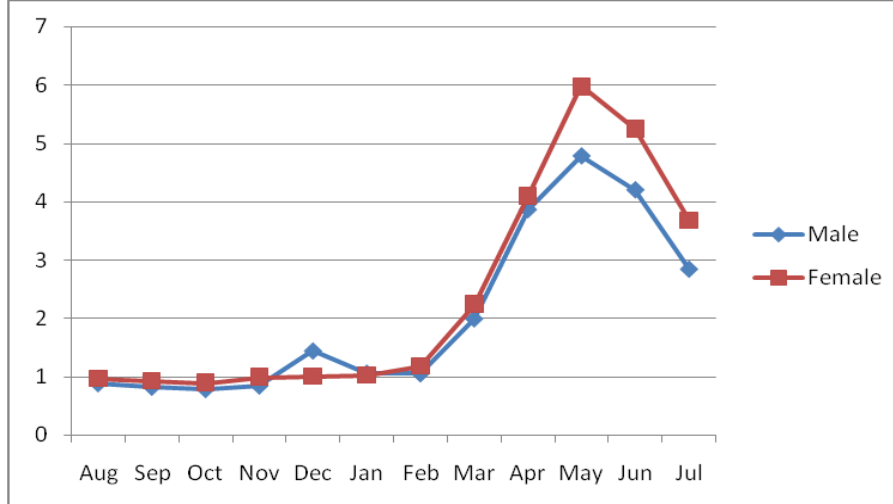


Figure 2: Monthly variations in Gonado-somatic index of male and female *Notopterus notopterus*