

## SEASONAL CHANGES OF PROTEIN IN THE TISSUES OF MALE CATFISH *MYSTUS CAVASIUS* (HAM) IN BHADRA RESERVOIR, KARNATAKA, INDIA

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**ABSTRACT:** Biochemical constituents of body of the freshwater fish *Mystus cavasius* were greatly influenced by the breeding activity. Protein was estimated from testes, liver and muscle at different breeding phases. There was an increase in protein levels of testes during maturation of testes was observed and it was related to simultaneous decrease in the liver and muscle. While in immature and preparatory stage, it was found to be the storage phase of protein in muscle and liver. Depletion of protein in muscle and liver and is transferred to testes during maturation has been found to be significant.

**Key words:** *Mystus cavasius*, Bhadra Reservoir, Protein, Shivamogga

### INTRODUCTION

Biochemical compositions of fish tissue are of considerable interest for their specificity in relation to food values of fish and for evaluating their physiological needs at different periods of life. A number of workers have studied the depletive effects of maturation and spawning in the chemical composition of fish (Chang & Idler, 1960; Appa Rao, 1967; Pandey et al., 1976; Piska & Prasad, 1991; Kiran & Puttaiah, 2005). *Mystus cavasius* is a commercially important fish having high protein contents and taste. The seasonal biochemical variations correlating testes, muscle and liver have not been given much attention of *Mystus cavasius* of Bhadra reservoir. Hence keeping in view of the commercial importance of fish, an attempt have been made to study the storage and utilization of liver contents for testicular growth and spermatogenesis.

### MATERIALS AND METHODS

The male fish *Mystus cavasius* were collected several times per month from Bhadra reservoir during January 2004 to December 2004 and were obtained from fisherman. They were brought in to the laboratory and then scarified for furthers studies. The tissue was processed for protein estimations. The protein was estimated as method described by Lowry et al., 1951.

### RESULTS AND DISCUSSION

The protein contents of testes, liver and muscle for one year are presented in Table 1 and depicted Figure 1. Monthly variation of protein of testis, liver and muscle are depicted in Figures 2-3. Correlations of Protein content in testes, liver and muscle are give in Table 2. The observation indicates that *Mystus cavasius* has prolonged breeding period, starting from February to July, where development and maturation takes place. August and September are Post-spawning months and spent season was seen during October and November. Protein levels of testes ranged from 0.52±0.01 to 1.99±0.10. The minimum in December and maximum in the month of July. Protein levels of liver fluctuated between 0.43±0.01 (July) to 12.65±0.11 (December). Protein levels of muscle ranged from 0.42±0.01 to 5.27±0.04, being maximum in December and minimum in July.

Monthly variation of protein contents of liver with testes shows an inverse relationship i.e., in the testicular protein during February ( $0.91\pm 0.12$ ) reaching maximum during July ( $1.99\pm 0.10$ ), on the contrary the hepatic protein increases during February ( $6.54\pm 0.10$ ) reaching minimum during July ( $0.43\pm 0.01$ ) suggests the involvement of hepatic protein for testicular growth and spermatogenesis. Such observations were made in *Channa punctatus* and *Heteropneustes fossilis* (Verma et al., 1985) and in *Labeo rohita* (Manohar Patil & Kulkarni, 1994). Proteins play an important role in enzymatic catalysis in transport or mechanical support for the control of growth and maturation of testes.

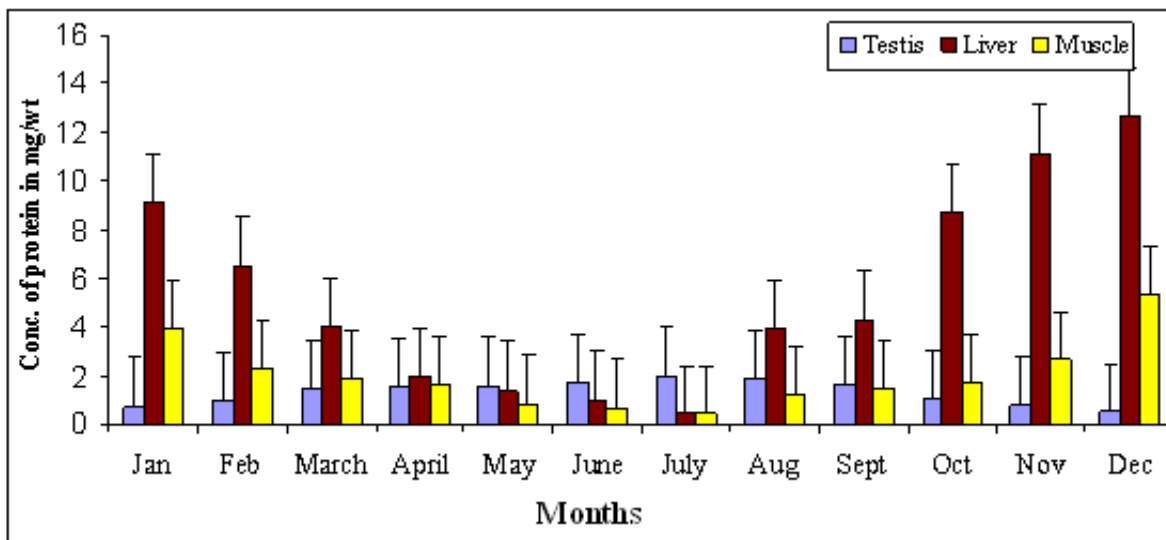
**Table 1. Monthly variations of proteins in different organs**

Months-2004	TESTIS	LIVER	MUSCLE
January	$0.71\pm 0.01$	$9.16\pm 0.12$	$3.94\pm 0.02$
February	$0.91\pm 0.12$	$6.54\pm 0.10$	$2.32\pm 0.03$
March	$1.43\pm 0.05$	$4.03\pm 0.07$	$1.87\pm 0.01$
April	$1.55\pm 0.02$	$1.94\pm 0.02$	$1.63\pm 0.01$
May	$1.58\pm 0.06$	$1.41\pm 0.01$	$0.79\pm 0.01$
June	$1.69\pm 0.06$	$0.98\pm 0.01$	$0.62\pm 0.01$
July	$1.99\pm 0.10$	$0.43\pm 0.01$	$0.4\pm 0.01$
August	$1.03\pm 0.01$	$3.93\pm 0.02$	$1.17\pm 0.02$
September	$1.63\pm 0.05$	$4.31\pm 0.04$	$1.63\pm 0.03$
October	$1.88\pm 0.06$	$8.69\pm 0.10$	$1.51\pm 0.02$
November	$0.73\pm 0.01$	$11.14\pm 0.11$	$2.65\pm 0.03$
December	$0.52\pm 0.01$	$12.65\pm 0.11$	$5.27\pm 0.04$

**Table 2. Correlations of Protein content in different tissues**

	Testes	Liver	Muscle
Testes	1.000	.869**	-.880**
Liver	.869**	1.000	-.923**
Muscle	-.880**	-.923**	1.000

\*\*Correlation is significant at the 0.01 level (2-tailed)



**Figure 1. Monthly variation of Proteins in Testis, liver and Muscle**

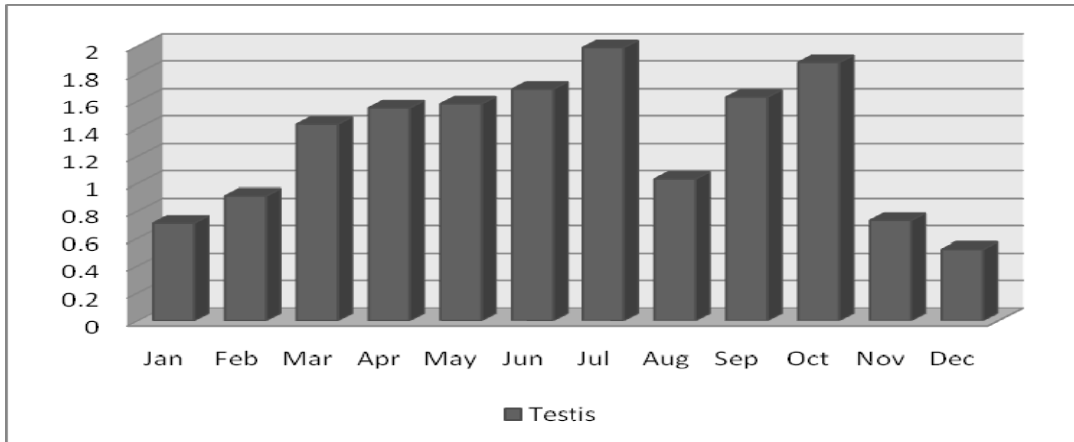


Figure 2. Monthly variation of Protein contents of testis of male fish *Mystus cavasius*

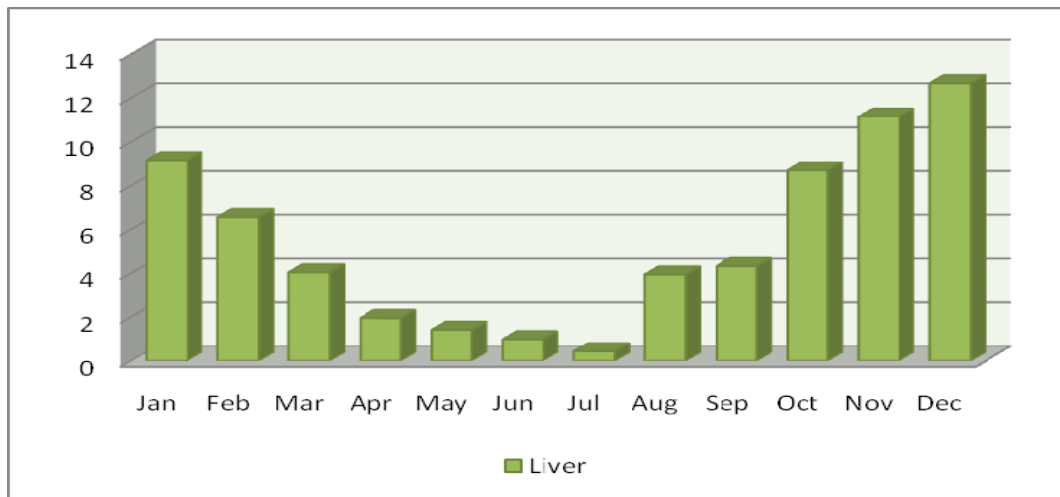


Figure 3. Monthly variation of Protein contents of liver of male fish *Mystus cavasius*

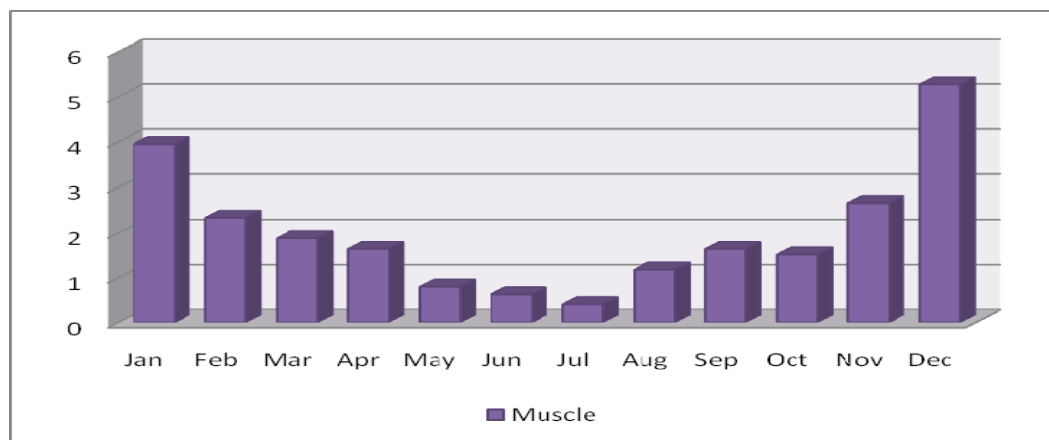


Figure 4. Monthly variation of Protein contents of muscle of male fish *Mystus cavasius*

Norman reported that the stage of gonads may play a great role in the biochemical composition of a fish. Hence, the observation made here is in agreement with Norman (1962); Singh et al., 1993; Dhason and Sexena (1998); Kiran & Puttaiah (2005); Kour and Kour (2006), Joseph Marykuttu et. al., (2011), Shendge et al., (2012). The proteins in the flesh of fish are important for the tissue building activity of those who consume them. Protein cycle does not show any relationship with intensity of feeding. Low value of protein content in winter or post-monsoon season may be a consequence of greater utilization of protein for energy requirements in the season.

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