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Research Paper

Study on Gonosomatic Index of female *Discognathus modestus* in River Son at Anuppur

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Abstract: Gonosomatic index of female *Discognathus modestus* were studied during one year. The experiments were conducted from January 2016 to December 2016. After dissecting, gonads were preserved in 10 % formalin. Results showed that *Discognathus modestus* is a heterosexual fish. Gonads were fully developed during the month of June, July, and August when the GSI were the highest. The values of Gonosomatic index were maximum at the time of spawning. This indicates that Gonosomatic index are the key factors of reproductive cycle of *Discognathus modestus.* Water temperature also measured during the course of study and its fluctuations show that it is also affect the growth and development of gonads.

Keywords: Discognathus modestus**,** Gonosomatic index, spawning,

INTRODUCTION

Discognathus modestus is a hill stream residing fishes live mostly towards bottom and thus, consequently the mouth shifted more ventrally as a semicircular cleft, facilitating them to browse at the bottom sediment or on the epilithic flora or fauna. Horney covering on the inner side of the jaws is an ideal device to scrap up the food items from the rocky or stony substrata. Eyes are reduced and due to bottom dwelling nature air bladder also reduced. Since they have to bear a greater force of rushing water than these fishes have developed discs formed by the modification of skin on the ventral surface by means of which they adhere to rocks. Besides, horizontal placement of paired fins is also noticeable in these fishes. Reproductive potential of a population is one of the basic demands to designate the individuals of that population in respect to their gonadal conditions (Akter *et al*., 2012). In order to achieve success in fish culture, it is important to assess the breeding cycle with fecundity of cultivable fishes. Knowledge on the fecundity of a fish species is important for determining: spawning potential and its success (Das *et al.*, 1989; Karim and Hossain, 1992); fluctuations in the egg production potential of individual stock related to life processes such as age and

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growth (Shaheena, 2012); effects of environmental factors (Bromage *et al.*, 1992); and formulating the commercial management of fishery (Lagler, 1956). Reddy (1979) mentioned that determination of breeding season is an essential part of biological investigations of fishes.

MATERIALS AND METHODS

FISH COLLECTION AND MEASURMENTS

Experimental fish *Discognathus modestus* were collected from River Son at Anuppur. Sampling started in January to December 2013.The samples were carefully transported to the laboratory. Water temperature also was measured in situ at the time of sampling by WTK.

In laboratory before dissection and removal of gonads Total body weight in gram (g) and Length of fishes in centimeter (cm) were recorded. After measurement an incision was made on ventral side of the abdomen and gonads were separated carefully. Immediately the weight and length of gonads also were measured.

GONOSOMATIC INDEX

After that GSI were calculated according to the formula of Lane and Matty (1980).

GSI = g / G x100

Where, g = Weight of gonad
G = Weight of Fish

RESULTS & DISCUSSION

Environmental parameters

Table-I and Figure-1 shows monthly changes in the water temperature during the period of study. The minimum atmospheric temperature of the year is recorded in the month of January (14.5), whereas the maximum temperature (28.9) of the year was in the month of June.

Body weight: At the start of the experiment in January the mean body weight was 20.8944g probably because of lower temperature and photoperiod After February, the body weight started increasing gradually and reached 24.9422g in August, the ovaries were fully developed when water temperature and photoperiod was maximum.

Gonad weight: The weight of Ovary (1.0112g) was the lowest in December, while the highest values (5.9244g) were encountered in August. **(Table I).**

Gonad somatic index (GSI): The GSI values were lowest during the month of January (13.1920), while the maximum were seen in August (23.7525).The monthly distribution of gonad somatic index (GSI) of female *Discognathus modestus* is given in

Table I and **Figure 2**.

The GSI, which is indicative of the breeding season of the fish, was calculated from January to December. There was a spectacular rise in the values in April to August (16.6871 to 23.7525). The highest gonado-somatic index of female *Discognathus modestus* was 23.7525 in August and the lowest was 5.0668 in October. The present experiment indicated that the fish spawn once in a year during April to August with a peak in August.

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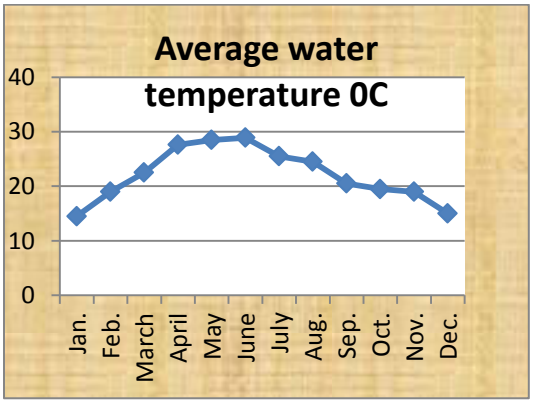
Table 1. The monthly distribution of gonad somatic index (GSI) of female *Discognathus modestus*

Month	Average Weight of fish (grm)	Average weight of ovary (grm)	Average GSI (%)	Average Temperature (C)
Jan.	20.8944g	2.7564g	13.1920	14.5
Feb.	21.9174g	2.8932g	13.2004	19.0
March	22.0012g	3.0032g	13.6501	22.5
April	23.8842g	3.9856g	16.6871	**27.6**
May	24.0124g	4.6248g	19.2600	**28.5**
June	24.0212g	5.1168g	21.3011	**28.9**
July	24.8352g	5.6426g	22.7201	25.5
Aug.	24.9422g	5.9244g	23.7525	24.5
Sep.	20.2332g	1.1082g	5.4771	20.5
Oct.	20.2018g	1.0236g	5.0668	19.5
Nov.	19.1958g	1.0218g	5.3230	19.0
Dec.	19.6062g	1.0112g	5.1575	15.0



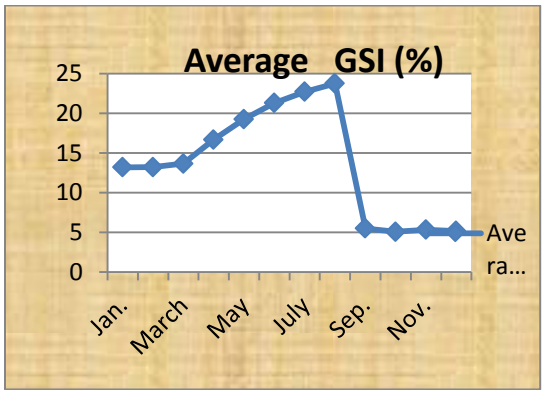


Figure : 01 and 02 showing water temperature and GSI during different months of year.

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