Indian J.Sci.Res. 12 (2): 007-010, 2017

ISSN: 0976-2876 (Print)
ISSN: 2250-0138(Online)

STUDY ON GONOSOMATIC INDEX OF MALE *DISCOGNATHUS MODESTUS* IN RIVER SON AT ANUPPUR

SANGEETA MASHI[a1] AND VANDANA RAM[b]

[ab]Department of Zoology, Pt.S.N.S.P.G.College, Shahdol, Madhya Pradesh, India

ABSTRACT

Gonosomatic index of male *Discognathus modestus* were studied during one year. The experiments were conducted from January 2015 to December 2015. 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, Gonads, Reproductive cycle

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 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 Measurements

Experimental fish *Discognathus modestus* were collected from River Son at Anuppur. Sampling started in January to December 2015.The samples were carefully transported to the laboratory. Water temperature also was measured in situ at the time of sampling.

In laboratory before dissection and removal of gonads Total body weight in gram (g) and Length of fishes in centimetre (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.

[1]Corresponding author

Gonosomatic Index

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

$$GSI = g / G \times 100$$

Where, g = Weight of gonad

G = Weight of Fish

RESULTS & DISCUSSION

Environmental Parameters

Table-1 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 (19.6), whereas the maximum temperature (30.9) of the year was in the month of June.

Body Weight

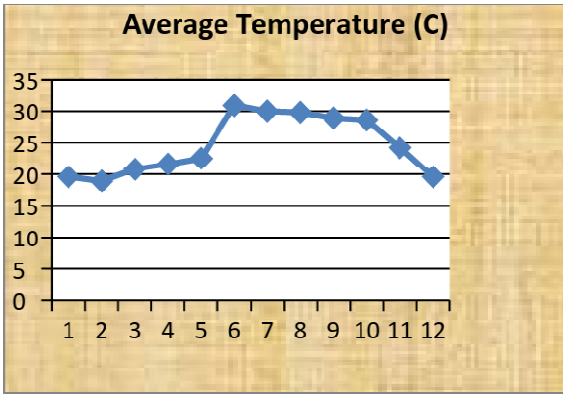
At the start of the experiment in January the mean body weight was 9.9256g probably because of lower temperature and photoperiod, After February, the body weight started increasing gradually and reached 13.9250g in July, the testes were fully developed when water temperature and photoperiod was maximum.

Gonad Weight

The weight of testes (7.4mg) was the lowest in December, while the highest values (19.7mg) were encountered in June. (Table 1).

Table1:

Month	Average Weight of fish (grm)	Average weight of testes (mg)	Average GSI (%)	Average Temperature (C)
Jan.	9.9256	9.8	0.0987	19.6
Feb.	10.2650	9.9	0.0964	18.9
March	11.5690	8.9	0.0769	20.8
April	12.3290	15.8	0.1281	21.6
May	12.9687	18.4	0.1418	22.5
June	13.2956	19.7	0.1481	30.9
July	13.9250	17.7	0.1271	30.0
Aug.	12.5620	9.7	0.0772	29.8
Sep.	12.2658	8.2	0.0619	28.9
Oct.	11.5289	7.6	0.0641	28.6
Nov.	11.3209	7.5	0.0724	24.2
Dec.	10.5628	7.4	0.0710	19.6



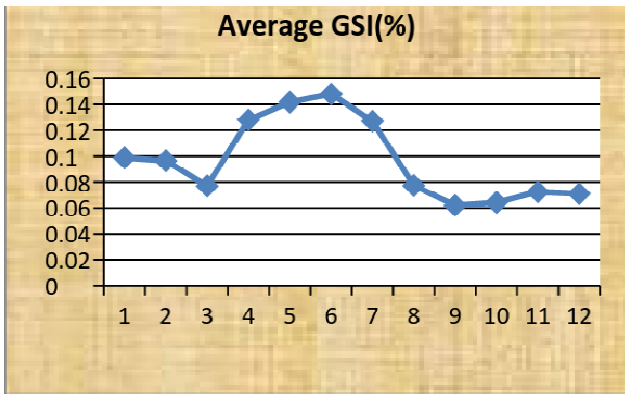


Figure 1 & 2: Graph, showing water temperature and GSI during different months of year

GONAD SOMATIC INDEX (GSI)

The GSI values were lowest during the month of January (0.0987), while the maximum were seen in June (0.1481).The monthly distribution of gonad somatic index (GSI) of male *Discognathus modestus* is given in Table 1 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 June (0.1281to 0.1481). The highest gonado-somatic index of male *Discognathus modestus* was 0.1481in June and the lowest was 0.0619 in September. The present experiment indicated that the fish spawn once in a year during April to June with a peak in June.

ACKNOWLEDGEMENTS

Authors are thankful to Dr. S.K.Saxena Principal and Dr.Binay Kumar Singh HOD of Zoology Department, Pt.S.N.Shukla Govt PG College Shahdol, for providing essential facilities during the work. Vandana Ram is thankful to University Grants Commission New Delhi for the award of Post Doctoral Fellowship vide letter No: F./PDFSS-2014-15-SC-MAD-9038.

REFERENCES

Akter H., Islam M.R. and Belal Hossain M., 2012. Fecundity and gonado-somatic index (GSI) of Corsula, *Rhinomugil corsula* Hamilton, 1822 (Family: Mugilidae) from the Lower Meghna River Estuary, Bangladesh. Global Veterinaria., **9**(2) 129-132.

Bromage N., Jones J., Randal C., Thrush M., Davies B., Springate J., Duston J. and Baker G., 1992. Brood stock management, fecundity, egg quality and the timing of egg production in the rainbow trout (*Oncorhynchus mykiss*). Aquaculture, **100**: 141-166.

Das M., Dewan S. and Debnath S.C., 1989. Studies on fecundity of *Heteropneustes fossilis* (Bloch) in a mini pond of Bangladesh Agricultural University, Mymensingh. Bangladesh Journal of Agricultural Science., **16**(1) 1-6.

Karim, M.A. and Hossain A., 1992. Studies on the biology of spiny eel, *Mastacembelus pancalus* in artificial ponds. Part II. Sexual

maturity and fecundity. Bangladesh Journal of Agricultural Science, **1**:15-18.

Lagler K.F., 1956. Freshwater Fishery Biology. Second Ed. WMC Brown Company, Dubuque, lowa. 421.

Reddy B.P., 1979. Maturity and spawning in the murrel, *Channa punctatus* (Bloch, 1973) (Pisces, Teleostei, Channidae) from Guntur, Andhra Pradesh. Proceedings of Indian National Science Academy B **45**(6):543-553.

Shaheena Shafi, 2012. Study on fecundity and GSI *Carassius carassius* (Linneaus, 1758-introduced) from Dal Lake Kashmir. Journal of Biology, Agriculture and Healthcare, **2**(3):68-75.