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Study on Fecundity of *Badis dibruensis* Geetakumari & Vishwanath, from the Subansiri River (Brahmaputra Basin) Assam, Northeast India

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Abstract: ***The present investigation deals with the study on fecundity of Badis dibruensis collected from the Subansiri River (Brahmaputra basin), Assam, Northeast India. Fecundity of the fish was found from 48 to 635. The relationships of fecundity with total length (TL), body weight (BW), ovary length (OL) and ovary weight (OW) was found to be linear and positively correlated. As indicated by the value of 'r' (= 0.7854), the fecundity is more closely related to the ovary length (OL) indicating the better index of fecundity compared to the other studied parameters.***

Keywords: Fecundity, *Badis dibruensis*, River Subansiri, Assam.

1. Introduction

Sustainable fish culture should emphasize on the culture and management of indigenous fish species in order to meet the demands of annual fish intake and, hence, protect the available fish germplasm resources from possible future extinction [1]. In this regard, fecundity forms one of the important aspects of fish biology for evaluation of the reproductive potential of a fish species and explaining the variations in the levels of its population [2][3]. *Badis dibruensis* is a small indigenous species of fish, endemic to the Brahmaputra basin, Northeast India. Although the species has negligible food value, their camouflage behavior marks them as important freshwater ornamental fish. There is no available data on fecundity for this species in Fishbase [4]. Therefore, the present study provides the first report on fecundity of *B. dibruensis* from the Subansiri River (Brahmaputra basin) Assam, Northeast India.

2. Materials and Methods

Collection

Fishes were collected during morning hours by using fishing gears (cast nets: 9′, 1 ⁄ 2″; gillnets: 30 × 0.9 m) from one selected sampling site — Gerukamukh (27°32′09″N, 94°15′28″E), from February 2017 to April 2018.

Measurement

Total lengths of the fishes were taken with a digital slide caliper (Mitutoyo, CD–8″CSX), nearest to 0.01 mm, and then the values were converted into centimeter. Weights were taken with an electronic balance (SPT–600, Prime Technologies) nearest to 0.01 g.

Estimation

Fecundity was estimated using the gravimetric method [5]. The correlation coefficient (*r*) and linear relationship of fecundity with different body parameters [total length (TL), body weight (TW), ovary length (OL) and ovary weight (OW)] were calculated using Microsoft Excel software.

3. Results

Fecundity and different body parameters of *B. dibruensis* (for 30 specimens) are given in Table 1. Fecundity varied from 48 (4.22 cm TL; 1.30 g BW) to 635 (4.30 cm; 1.45 g BW). The correlation co-efficient (*r*) between TL and F, BW and F, OW and F, and OL and F was found to be 0.2504, 0.2713, 0.7725, and 0.7854 respectively. The relationship between Log F and Log TL, Log F and Log BW, Log F and OW, and Log F and OL respectively are given in Fig. 1a–d.

Table 1: Fecundity of *Badis dibruensis* with respect to TL, BW, OW & OL from the Subansiri River (Brahmaputra basin), Assam, Northeast India

SL No.	Total Length (cm)	Body Weight (g)	Ovary Weight (g)	Ovary Length (cm)	Fecundity
1	4.52	1.71	0.11	1.05	307
2	3.52	0.76	0.18	0.99	313
3	4.43	1.44	0.12	1.17	408
4	4.13	1.08	0.21	1.23	430
5	3.87	1.16	0.16	0.98	403
6	3.47	0.72	0.1	0.96	251
7	4.1	1.11	0.12	1.06	428
8	4.22	1.3	0.04	0.78	48
9	3.26	0.61	0.05	0.78	167
10	3.67	0.85	0.15	1.04	355
11	3.74	0.96	0.18	0.86	353
12	3.36	0.66	0.11	0.87	346
13	3.88	1.03	0.15	1.01	363
14	4.3	1.45	0.22	1.25	635
15	3.76	0.94	0.16	1.04	366
16	3.78	0.88	0.14	1.1	447
17	4.01	1.13	0.21	1.19	532
18	3.46	0.7	0.16	1.07	353
19	3.48	0.74	0.14	0.93	297
20	3.65	0.8	0.09	0.92	344

21	3.42	0.65	0.06	0.73	83
22	3.53	0.81	0.12	1.1	247
23	3.89	1.03	0.12	1.01	433
24	3.73	1.08	0.16	1.05	416
25	3.93	1.04	0.11	1.07	358
26	3.71	0.98	0.16	0.96	333
27	3.55	0.73	0.05	0.86	274
28	3.58	0.78	0.12	0.96	307
29	3.24	0.64	0.07	0.9	232
30	3.88	1	0.07	1.02	375

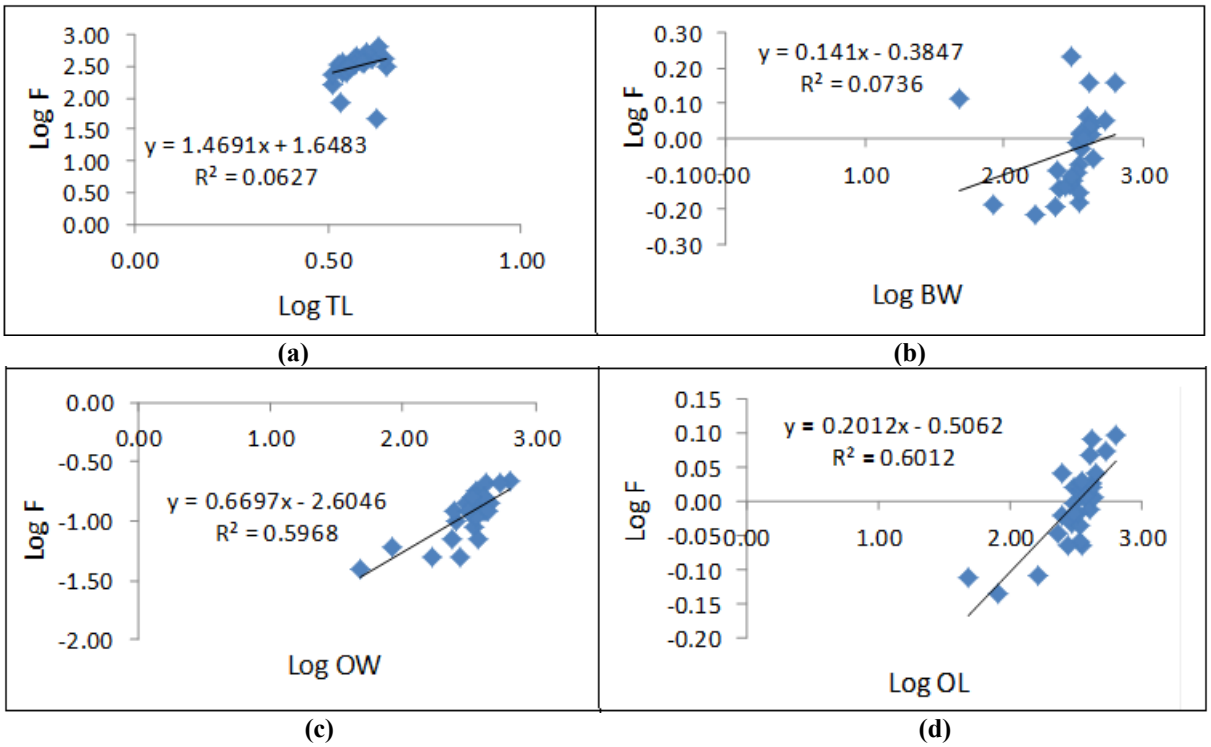

Figure 1: Relationship between a. fecundity (F) and total length (TL); b. fecundity (F) and body weight (BW) of fish; c. fecundity (F) and ovary weight (OW); and d. fecundity (F) and ovary length (OL) of *B. dibruensis*

4. Discussion

The variation in egg production among individuals of the studied species may be attributed to the differences in age and size [6]. In the present study, the minimum fecundity was found at a size of 4.22 cm, which was nearly the same size of the specimen with maximum fecundity (= 4.30 cm). Such differentiation in the growth of gonads may have occurred due to high deposition of fat in the former specimen. Thus, this may be the reason the fecundity of individual fish of the same size drawn from the same spawning population sometimes show considerable deviation [7].

The relationships of fecundity with total length (TL), body weight (BW), ovary length (OL) and ovary weight (OW) was found to be linear and positively correlated. The values of correlation coefficient '*r*' in the present study indicate that among the four studied parameters, fecundity was observed to be most closely correlated with ovary length (r=0.7854) followed by ovary weight (r=0.7725), total body weight (r=0.2713) and total body length (r=0.2504). Hence, ovary length is the better index of fecundity than other parameters.

This study is the only a piece of work on fecundity of *B. dibruensis*, which will provide a basic knowledge to future fish biologists.

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