

Fecundity of a fish, *Cirrhinus fulungee*, from the River Godavari, Maharashtra

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Fecundity is reproductive capacity of a fish determined by the number of eggs stored in each spawning season and its knowledge is extremely important in successful management and exploitation of its fishery.

The analysis of fecundity data in relation to size and weight of the fish has often been used to provide a reliable index of density dependent factors affecting the population size. Inhibition and reproductive process due to influence of physico-chemical factors affects fecundity. Dense population of the fish brings in intra and interspecific competitions for food and reproduction.

Franz (1940) and Clark (1934), have observed that the fecundity in fishes increases in proportion to the square of the length. Hickling (1940), observed that the fecundity increased at a rate above the cube of the length in Herring of Southern North area. Simpson (1951), concluded that the number of eggs is related to the volume and consequently to the cube of the length. Lehman (1953), found a straight line relationship between the fecundity and length in American Shad *Albosa sapidissima* and stated that there is a direct proportional to increase in fecundity with increase in length, weight and age of the fish.

Material and Methods

Monthly sampling of normal, good, healthy and mature fish specimens of the *Cirrhinus fulungee* were done for estimation of fecundity from station B, on river Godavari at Nanded (Maharashtra state) from July-2008 to June-2010. Mature specimens were collected in the months of June to September 2008, 2009.

Altogether 450 specimen of *Cirrhinus fulungee* were collected during sampling from July-2008 to June-2010. Out of which 250 specimen were mature, of which 150 were females. From these 150 females, a sample of 10 fish was drawn randomly to determine fecundity. Specimens ranging from 14.6 to 25.8 cm in total body length, from tip of snout to distal end of caudal fin were selected. Before dissecting, the females were weighed carefully and their weight noted. After dissecting the females, ovaries were weighed properly and their weight was noted. The ovaries in stage IV were preserved in 10% formalin. The ovaries after being hardened for few days, removed from formalin and surface moisture was

blotted with blotting paper. The entire ovary was then weighed accurately to nearest milligram.

A small portion (1 gm) from the middle region of the ovary was then teased on a slide and few drops of formalin were put on them and number of ova were counted under the microscope. Care was taken to ensure that the ova were spread evenly in a single layer. From the number of ova obtained from the small portion of an ovary of known weight (1 gm), the number of ova in the entire ovary was calculated on the basis of its total weight.

Observations and Results

The fecundity estimates of the entire specimen examined were made by egg counts and also from variables like weight of fish and weight of ovary. The females ranged between 14.6 and 25.8 cm in length and 25.166 and 75.240 gm in weight, whereas the weight of ovary varied between 4.165 and 21.650 grams.

In *Cirrhinus fulungee*, the total number of ova varied from 1132 to 3170, which has given an average of 39 to 48 numbers of eggs per gram body weight (Table 1).

Discussion

Studies on fecundity are receiving much attention as they play a key role in fish stock assessment. Fecundity is the most important aspect of fishery biology. Fecundity has been determined for many fishes which provide information of population dynamics, racial characteristics, production and stock recruitment problems.

Different relationships have been found to exist between fecundity and various parameters. In *Catla* the fecundity is more closely related to weight of fish. The ratio of the total number of ova varied from 2, 72,944 in a fish measuring 529 mm total length to 27,17,036 in the fish measuring 824 mm total length. The minimum fecundity of *Catla* was 2,10,118 numbers of egg in a fish measuring 504 in length and largest specimen of 840 mm had the maximum fecundity of 34,21,005 numbers of eggs (Sakhare, 2000).

According to Chonder (1977) the number of egg production depends upon the weight of ovary more closely, as observed during present study of *Cirrhinus fulungee*, also appears to be related more specifically to the ovary weight.

Table 1. Fecundity of *Cirrhinus fulungee*, in Godavari, Maharashtra.

	Wt. of fish (gm)	Length of fish (cm)	Wt. of ovary (gm)	Total number of ova in ovary	No. of ova per gm body weight
1.	32.150	22.87	5.320	1286	40
2.	30.450	17.15	5.040	1279	42
3.	25.166	14.60	4.165	1132	45
4.	26.755	15.67	4.427	1284	48
5.	75.240	25.80	21.650	2934	39
6.	65.380	23.00	10.820	2680	41
7.	60.850	21.75	10.070	2616	43
8.	25.850	14.90	4.278	1163	45
9.	28.150	16.50	4.658	1239	44
10.	70.450	24.85	11.659	3170	45

References

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(brought forward from page 77)

runs six large animal galleries at the Indian Museum, Kolkata, and an Aquarium at the Digha coast (W. Bengal). All Regional Centres have their own buildings (with museum).

The survey of endangered and threatened species of Indian animals is an important objective of the ZSI. Both the field work and laboratory studies lead to unravel present status of populations for conservation efforts. Red Data Books of the vertebrates and the butterflies have been published. A special series under the title 'Conservation area series' is issued on the fauna of National Parks, Wildlife Sanctuaries and Tiger Reserves.

ZSI is well known for its taxonomic studies. This has brought to light a large no. of new families, new genera and new species to the science. The volumes under the 'Fauna of India' series (earlier the 'Fauna of British India including Ceylon and Burma') on different animal groups, are a lasting gift of ZSI to the nation.

Two special commemorative postal stamps on a sheet (see page 77) was released by the Govt. of India, in recognition of the department's achievements, on 3rd Dec. 2015.

The final centenary celebration of ZSI was held on the afternoon of the 1st July 2016, at its premises at Kolkata

(called the Prani Vigyan Bhawan). The chief guest was Shri Prakash Javadekar, the then Hon'ble Union Minister of Environment, Forest & Climate Change, Govt. of India, and the guest of honour was Shri Shovan Chatterjee, Hon'ble Minister-in-charge of Environment, Govt. of West Bengal. Some other high officials and dignitaries from different parts of the country attended. A special logo, the 'Jeevan Dhara' metal sculpture, to commemorate the centenary, was inaugurated. Several new publications of ZSI were released on the occasion.

A three-days symposium, the 'National Conference on Faunal Diversity in the Indian Land and Seascapes' was held from the 30th June to 2nd July, 2016. Some prominent Indian biology scientists, like Dr R Sukumar (Indian Instt. of Science, Bengaluru), Dr Ms B Meenakumari (Chairperson N B A, Chennai), Dr K Shankar (Director SACON, Coimbatore), Prof M S Jairajpuri and Dr A K Ghosh (former Directors ZSI), Mr Biswajit Roy Chowdhary (Editor *Environ*), Dr A J T John Singh (Wildlife Instt. of India, Dehradun) etc. participated in it. Yours truly also attended the celebrations and the National Conference.

—R. K. Varshney