

Research Article

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Fecundity of Mozambique Tilapia (*Oreochromis Mossambicus* Peters) from Reservoirs of Beed District in Maharashtra, India



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Abstract

Observations made on the fecundity of the mozambique tilapia (*Oreochromis mossambicus*) from reservoirs of Beed district, Maharashtra, India are reported. The ovarian eggs were found to be of different sizes. The number of ova per gram mature ovary ranged from 235 to 390 and the number of ova per gram body weight, from 6.41 to 9.92, the average being 9.01. The fecundity increased with the increase in size of fish.

Keywords: *Oreochromis mossambicus*; Fecundity; Reservoirs; Maharashtra; India

Introduction

Tilapia is native to Africa and Middle East and has emerged from mere obscurity to one of the most productive and internationally traded food fish in the world [1]. The last three decades have seen significant developments in farming of tilapias worldwide. They are being farmed in about 85 countries worldwide. Tilapia belongs to the family Cichlidae under order Perciformes. There are about 70 species of tilapias, of which nine species are used in global aquaculture [2]. In India, tilapia (*Oreochromis mossambicus*) was introduced in 1952, with a view to filling up unoccupied niches such as reservoirs and ponds. These species spread across the country within a few years due to prolific breeding and adaptability to wide range of environmental condition. Introduction of tilapia in our culture system is advantageous because it represents lower level in food chain, and thus its culture will be economical and eco-friendly.

The term fecundity is generally used to denote the number of mature ova spawned by a female during its breeding season indicating the reproductive capacity of the fish [3]. The knowledge of the fecundity of a fish is extremely important for successful management and exploitation of its fishery. Therefore, fecundity of a species has direct bearing on the density of population of the species, survival and recruitment of new generation. Generally, species with a higher capacity for reproduction are subjected to lower rate of survival at various stages of development and vice

versa. The fecundity of different Indian freshwater fishes has been reported in recent years. Notable among them were Sugunan and Vinci, Singh and Srivastava, Nautiyal, Sakhare, Somdutt and Kumar, Alam and Pathak, Bhat, Mishra and Saksena, Chavan and Muley, Haque and Biswas, Priyadarshini et al. [4-16]. However, there has been no report on the fecundity of tilapia from Maharashtra State (India). Therefore, an attempt has been made to study the fecundity of tilapia (*Oreochromis mossambicus*) from reservoirs of Beed district (Maharashtra, India) for period of nine months i.e., February 2019 to October 2019.

Materials and Methods

The fish for present study were collected at random from different water bodies around Ambajogai in Beed district in Maharashtra (India) during the period from February 2019 to October 2019. A total of 15 specimens of *Oreochromis mossambicus* were collected in different months. The total length and weight of the fish were recorded to the nearest millimeters and grams respectively. In the present study, the gravimetric method was used for the estimation of fecundity. After liberation from the ovarian tissue, the ova were thoroughly washed and spreader on blotting paper to dry in air. The total number of ova so collected were weighed and the random samples of about 40 were counted and weighed. The total number of ova in the ovaries was then obtained from following formula [11]:

$$F = \frac{nG}{g}$$

Where,

F=Fecundity

G=Total weight of ova

g= Total weight of subsample in sample unit

n= Number of ova in the subsamples.

Results and Discussion

Fecundity in *O.mossambicus* is very variable as reported by different investigators. According to Hora and Pillay [17], the female tilapia lays 75-250 eggs at a time. Vaas and Hoftstede [18] found that the fecundity of *T.mossambica* ranged from 80 to 300 ova for fish with length that ranges from 8 to 11 cms in total length. Dietmar [19] counted eggs from ovaries of *T. mossambica* and found them to range between 390 and 910 with female body weight ranging from 92 to 365 gms. Sukumaran [20] reported the range of fecundity in *T.mossambica* from 100 to 900 eggs in

fishes ranging from 81 to 220 cm in total length. Kulkarni [21] reported the total number of ova in individuals varied from 169 to 772 in species ranging from 103 to 179 cms in length. Mironova [22] reported that the fecundity of tilapia ranged from 80 to 1000 eggs per female. De Silva and Chandrasoma [23] found fecundity of *O. mossambicus* ranging from 360 to 1775 eggs per female for ranging from 20 to 31.9 cm in total length.

Ovarian wall becomes thin and highly vascular during the spawning period. Ovarian lumen is loosely organized, and zonation is not apparent. During the present investigation the fecundity of *Oreochromis mossambicus* varied from 188 (for a fish with total length 122 mm and body weight 29.3 gm) to 920 (for a fish with total length 194 mm and body weight 94.3 gm). The largest fish with a total length of 194 mm and body weight 94.3 gm showed the fecundity of 920. The smallest sized fish in the sample with a total length 122 mm and body weight 29.3 gm showed the fecundity of 188. The mean fecundity of 15 females was recorded as 618 eggs for a fish with a mean total length of 166.13 mm and mean body weight of 67.45 gm (Table 1). The observed mean total weight of the ovary was 1.76 gm.

Table 1: Details of female specimens collected from reservoirs of Beed district in Maharashtra

Total length (mm)	Body weight (gms)	Ovary weight (gms)	Total number of ova	Number of ova/gm body weight	Number of ova/gm ovary weight	Ovary weight as % of body weight
122	29.3	0.798	188	6.416	235.58	2.723
127	30.8	0.82	200	6.493	243.902	2.662
139	47.7	1.375	398	8.34	289.454	2.882
149	53.2	1.484	490	9.21	330.188	2.789
157	56	1.58	515	9.196	325.949	2.821
162	59.8	1.62	575	9.651	354.938	2.709
165	62.3	1.79	610	9.791	340.782	2.873
172	68.5	1.84	670	9.781	364.13	2.686
178	72.3	1.975	695	9.612	351.89	2.731
180	79.6	2.02	710	8.768	345.544	2.537
182	87.6	2.08	780	8.904	375	2.374
185	88.2	2.16	810	9.183	384.615	2.448
188	90	2.22	825	9.166	371.621	2.466
192	92.2	2.29	895	9.92	390.829	2.483
194	94.3	2.37	920	9.75	388.185	2.513

During present investigation the numbers of eggs were directly proportional to the weight of the fish and the fecundity increased progressively with ovary weight of fishes. Similar observations were also made by Roy *et al.* [24] and Parameswaran *et al.* [25]. Hatikakoty and Biswas [26] observed fecundity of *O.mossambicus* in the range of 546 to 1550 eggs/100 g body weight. In the present investigation it was observed that fecundity of *O. mossambicus* ranged from 641.6 to 992 eggs/100 g body weight indicating that the fecundity recorded in the present investigation was like those recorded elsewhere. The low fecundity in *O.mossambicus*

could well be attributed to the parental care. Furthermore, the low fecundity of *O.mossambicus* also might be due to prolonged breeding season. The ovary weight as percentage of the total weight of fish ranged from 2.37 to 2.88 with an average of 2.6.

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