

Studies on the sex ration of *Chela untrahi* of Bhadra reservoir, (Karnataka, India)

B.R. Kiran, E. T. Puttaiah and C.S. Anantha*

Department of Environment Science, Kuvempu University, Shankaraghatta-
*Bhadra fish seed farm, Bundh Breeding, B.R. Project

Abstract

In the present study 1432 specimens of *Chela untrahi* belonging to various size ranges were examined for sexuality at backwaters of Bhadra reservoir. Dominance of male was noticed in most of the size groups. Significant chi-square values were obtained in fishes of size between 81 and 100 mm during 1998-99 and 81 and 115 mm for 1999-2000. The overall male:female ratio was found to be 1:0.5057 and predominance of male was noticed all through the year.

Key Words: *Chela untrahi, Sex ratio, Chi-square, Bhadra reservoir.*

Introduction

A good deal of work has been done on the reproductive biology of various fishes. Notable among them are: Hickling 1930, Clark 1934, Keasteven 1942, Alikunhi 1956, Qasim and Qayyum 1961, Raitt 1968 and Bagenal 1978. A knowledge of the sex composition of catches is helpful in understanding whether any differential fishing exists and if solubility what possible bearing it has on the fishable stocks (Kesteven1942). It may indicate differences in the growth rate of the two sexes (Qasim 1966). *Chela untrahi* is included in the sub order-Cyprinoidei under the order-Physostomi and belong to the family-Cyprinidae (Day 1958). Most of the *Chela species* are inhabitants of tropical and subtropical waters. Bhadra reservoir from where specimens were collected for study serves as a source of fishing,

irrigation and for producing electricity. Fishermen and villagers also use it for drinking purpose and pisciculture of locally available fishes and other major carps. The Bhadra reservoir is located at a latitude 13° 45'-00"N and longitude 75°-30'-14" E. No scientific study has been conducted on the sex-ratio of *Chela untrahi* occurring in Bhadra reservoir so far. Hence, the present study was aimed at enhancing the knowledge regarding the sex ratio of *Chela untrahi* of Bhadra reservoir and to enable the formulation of suitable management measures towards rational exploitation and management.

Materials and Methods

The samples of *Chela untrahi* were obtained from the backwaters of Bhadra reservoir at Narasimharajapura near Kalgudda. *Chela untrahi* fishes were collected with the help of fishermen by using monofilaments gillnets of size 16 mm. Random samples were taken for sexuality of which 951 were males and 481 were females. The size (total length) range of species varied between 71 mm & 135 mm. The period of study was from July 1998 to June 2000. Fish samples were collected once in a month.

Results and Discussion

The results showed that male was dominant in most of the size groups. Table 1 represents the sex ratio of *Chela untrahi* in relation to size groups of fish. Significant chi-square values were obtained in size between 81 and 100 mm during 1998-99 and 81 and 115 for 1999-2000. Table 2 and 3 represents data on sex ratio of *Chela untrahi* with respect to different months of year. Predominance of male was noticed all through the year except in August and September 1998 and again August-99 when the ratio was most equal to the hypothetical 1:1 Chi-square (χ^2) values indicated that dominance of males in the population was significant during most part of the year and the male : female ratio was found to be 1:0.5057.

It is believed that the following factors might be responsible for sex composition.

- (a) Segregation of the sexes through various periods of the year including segregation resulting from sex differences in age and size at maturity,
- (b) Gear selectivity in relation to sex differences in morphology and in physiological activity and
- (c) Differences in natural and fishing mortality between sexes. Bannet 1962 states "Most studies of sex ratio of the individuals comprising isolated populations of fresh water fishes show more males than females among smaller fishes, but among the older fishes the dominance of females is solubility great as to leave little doubt that the males died off much faster than females".

Table 1 Sex ratio of *Chela untrahi* in different size groups from July 1998 to June 2000.

Year	1998-99					1999-2000				
Size groups (mm)	Males	Females	Total	X ² Values	Sex ratio	Males	Females	Total	X ² values	Sex ratio
71-75	1	0	1	1.0000	1:0.000	0	0	0	0	0
76-80	4	1	5	1.8000	1:0.2500	1	0	1	1.0000	0
81-85	37	17	54	7.40274*	1:0.4594	13	2	15	8.0666*	1:0.1538
86-90	135	49	184	40.1956*	1:0.3629	73	8	81	52.1605*	1:0.1069
91-95	136	78	214	15.7196*	1:0.5735	140	37	177	59.9378*	1:0.2642
96-100	127	51	178	32.4494*	1:0.4015	157	71	228	32.4386*	1:0.4522
101-105	35	27	62	1.0322	1:0.7714	71	59	130	1.1077	1:0.8309
106-110	4	13	17	4.7647*	1:3.2500	15	38	53	9.9811*	1:2.5333
111-115	0	3	3	3.0000	0	0	12	12	12.0000*	0
116-120	0	1	1	1.0000	0	2	8	10	3.6000	1:4.0000
121-125	0	0	0	0	0	0	4	4	4.0000	0
126-130	0	0	0	0	0	0	1	1	1.0000	0
131-135	0	0	0	0	0	0	1	1	1.0000	0
Total	479	240	719	79.4450*	1:0.5010	472	241	713	74.8401*	1:0.5106

* Significant at 5% Level

Table 2. Sex ratio of *Chela untrahi* in monthly samples from July 1998 to June 1999.

Months	Males	Females	Total	X ² values	Sex ratio
July 1998	18	19	35	0.0270	1:1.0555
August	31	29	60	0.0666	1:0.9355
September	30	30	60	0.0000	1:1.00
October	37	23	60	3.2667	1:0.6216
November	59	14	73	27.7397*	1:0.2372
December	42	27	69	3.2608	1:0.6428
January	45	15	60	15.0000*	1:0.3333
February	45	15	60	15.0000*	1:0.3333
March	47	13	60	19.2666*	1:0.2766
April	48	12	60	21.60000*	1:0.2500
May	34	16	50	6.4800*	1:0.4705
June 1999	43	27	70	3.6571	1:0.6279
Total	479	240	719	79.4450*	1:0.5010

* Significant at 5% Level

Data on sex ratio in different sizes showed that males were dominant in size groups other than 106110,

111-115 and 116-120 mm during 1998-99. But an observation during 1999-2000 revealed that the males were dominant in size groups other than 106-110, 111-115, 116-120, 121-125, 126-125, 126-130 and 131-135 mm. Austin 1971 studied the sex ratio in fishes of sizes up to 110 mm. He found that above 110 mm size range females were dominant over males. Similar condition was observed during the study period. Significant chi-square values were obtained with sex ratio in size groups of 81-85, 86-90, 91-95, 96-100, 106-110 and 111-115 mm during 1998-2000. Chi-square test was also applied to monthly samples and it was found that at 0.05 probability levels, significant difference was noticed in all the months except July, October and December 1998, June and August 1999 and June 2000. Joseph K. Manissery *et al.* 1979 studied the sex ratio in *Puntius ticto* in relation to months. According to them, male:female ratio of *Puntius ticto* was 1:0.901 and concluded that there is no significant difference between the observed and the expected values of 1:1 ($P=0.05$), in the sex ratio of *P.ticto*. However, in the present study there is a significant difference exists in the sex ratio of *Chela untrahi* (1:0.5057).

Table 3. Sex ratio of *Chela untrahi* in monthly samples from July 1999 to June 2000.

Months	Males	Females	Total	X ² values	Sex ratio
July 1999	16	44	60	13.0666*	1:2.7500
August	30	30	60	0.0000	1:1.0000
September	48	12	60	21.6000*	1:0.2500
October	14	46	60	17.0667*	1:0.2857
November	29	11	40	8.1000*	1:0.3793
December	53	7	60	35.2666*	1:0.1320
January	43	5	48	30.0833*	1:0.1162
February	39	15	54	10.6667*	1:0.3846
March	45	8	53	25.8301*	1:0.1777
April	54	11	65	28.4461*	1:0.2037
May	45	11	56	20.6428*	1:0.2444
June	56	41	97	2.3195	1:0.7321
Total	472	241	713	74.8401*	1:0.5105

*Significant at 5% level.

Sex ratio in *Chela untrahi* at different months and years has been showed that males outnumber females. Similar observation was made by Neelakantan *et al.* 1980-81 in *Lactarius lactarius*. While Vinci 1984 and Azad 1990 studying on *Silonia childreni* and *Anabas testudineus* reported that females outnumbered males. Nevertheless, Bhimasena Rao and Karamchandani 1986 noticed equal population of male and females in *Ompok bimaculatus* from Kulgarhi reservoir (M.P.). However among the

smaller fishes, males constituted the majority (Mc Fadden and Copper 1962, Bailey 1963 and Bhatnagar 1972). Therefore, the observations made in the present study are conformity with the above researchers.

Kesteven 1942 observed the predominance of males in Australian mullet (*Mugil dobula*) which he attributed to differential fishing. This may not be solubility in the case of *Chela untrahi* since no differential fishing has been observed. The apparent variation in the monthly sex ratios may be due to sampling variations. The insignificant differences in the number of individuals of both the sexes during spawning month (June, July, August, September, October, and December) indicated that males and females congregate during the spawning season. Therefore, fish catch should be avoided during aforesaid months.

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