

Comparison relative of abundance of *Capoeta capoeta gracilis* in five streams of Gorganroud River Basin, Golestan Province, Northern Iran

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ABSTRACT:

In this study 1705 individuals have sampled during spawning season in five streams of Gorganroud basin and investigated the lengths and relative abundance. The length varied from 4.1-23.2 cm. there were significant difference in length frequencies between male and female in each streams and length classes. Sex ratio was 1:1.78. Male dominance was observed in all population. Sixteen length classes were present. Maximum frequency was length class length 8.9-10.1 cm for males and 7.7-8.9 cm for females. Males were more frequent in medium size. Females were in varied size.

Keywords:

Relative abundance, length, *Capoeta capoeta gracilis*.

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INTRODUCTION

Capoeta capoeta gracilis, one of the subspecies of the genus *Capoeta* is very common and ubiquitous species that occurs in the rivers and streams of the South Caspian Sea basin (north of Iran) (Kiabi, et al. 1999 and Abdoli, 2000) and inhabiting both lotic and lentic habitats (Samaee et al 2006). This species is important for inland water fishing, aquaculture (Abdoli, 2000), sport fishing (kiabi, 1999) and zoogeographical studies (Armantrout, 1980).

There is a little information on the relative abundance and length frequency of *C. c. gracilis* by Rezaei et al 2007 in Madarsoo Stream and Gholizade et al. 2009 in Zarrin-Gol Stream. Information presented here is new for the other stream of the Gorganroud basin. The aim was determined by frequency of *C. c. gracilis* in Gorganroud basin.

MATERIALS AND METHODS

A total of 1705 specimens of *C. c. gracilis* were collected from in Gorganroud River Basin (Dough, Pishkamer, Tilabad, Zarrin-Gol, Chelchai Streams) at the spawning period in the spring season of April-May, 2010 and 2011 years. The samples were captured with an electroshock (220 V). The captured fishes were preserved in 10% formalin solution and transferred to lab for the estimation of length (cm), sexual and relative abundance. Total length ($L \pm 0.1$ cm) was recorded. Sex was determined by examination of the gonad tissue either with eye or with the aid of a binocular.

RESULTS AND DISCUSSION

Total 1705 fish examined, 1092 were males and 613 females. Sex ratio was significant from the

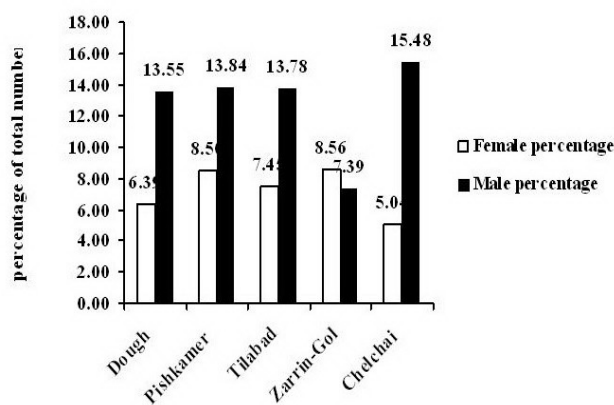


Fig. 1: Sex frequency (percentage of total number) in five streams of Gorganroud basin

parity, females dominated. The ratio of male to female was estimated as 1.78:1. Rezaei et al. (2007) has already reported the sex ratio for *C. c. gracilis* 1.5:1 in Madarsoo stream. Abdoli et al. (2008) reported sex ratio for *C. c. capoeta* 1:0.54 in Yasalegh stream. Turkmen et al. (2002) has reported sex ratio for *C. c. umbla* 1.3:1 and explained the sex ratio changes during spawning; males usually predominating at the start, after which the ratio becomes nearly 1:1, followed by a predomination of females. The males remain there longer or because the males shed mature sperm gradually.

Maximum and minimum relative abundance observed in Chelchai and Zarrin-Gol Streams for males and relative abundance was reverse for females (Fig. 1). The result of relative abundance showed significant difference between males ($\chi^2=52.02$, $p<0.05$) and between females ($\chi^2=215.279$, $p<0.05$).

In scrutiny length frequencies, maximum relative abundance was in range 8.9-10.1 cm and 7.7-8.9 cm for males and females respectively. Males were absent in larger length but. There were significant difference in length groups 6.5-7.7, 7.7-8.9, 8.9-10.1, 11.3-12.5 and 12.5-13.7 for females ($p<0.05$) and males ($p<0.05$) and also in length groups 10.1-11.3, 13.7-14.9, 14.9-16.1 for males (Table 1 and Fig. 2) between streams.

Analysis of relative abundance both in total number and in length groups showed that there were significant differences between five streams. Maximum and minimum relative abundance observed in Pishkamer and Zarrin-Gol Streams were 22% and 16% respectively. Abundance variations are more related to variation in food availability, water temperature, flow and other

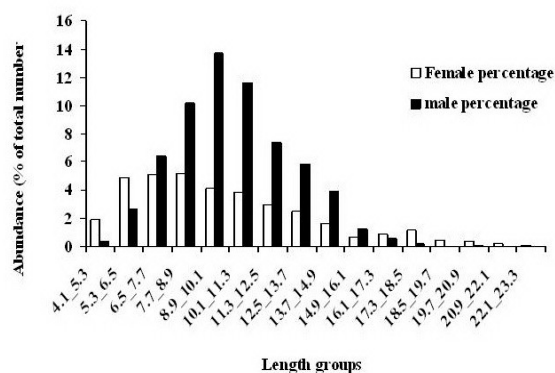


Fig 2: Total length (cm) abundance of males and females of five streams

Table1 Total length (cm) abundance of males and females of five streams (Dough, Pishkamer, Tilabad, Zarrin-Gol, Chelchai Streams)

S. No	Length groups	Percentage of females	Percentage of males	Female 2X	Male2X
1	4_5.3	1.935484	0.410557	16.88	0.286
2	5.3_6.5	4.926686	2.697947	4.69	2.47
3	6.5_7.7	5.102639	6.392962	17.69	21.87
4	7.7_8.9	5.219941	10.14663	16.81	39.74
5	8.9_10.1	4.164223	13.66569	5.81	62.25
6	10.1_11.3	3.870968	11.55425	29.6	21.55
7	11.3_12.5	2.932551	7.390029	24.79	23.44
8	12.5_13.7	2.521994	5.865103	10.96	30.3
9	13.7_14.9	1.583578	3.929619	4.66	50.836
10	14.9_16.1	0.703812	1.231672	8.85	22.8
11	16.1_17.3	0.821114	0.527859	5.63	5.44
12	17.3_18.5	1.11437	0.175953	1.75	
13	18.5_19.7	0.469208	0	1	
14	19.7_20.9	0.351906	0.058651	0.333	
15	20.9_22.1	0.175953	0		
16	22.1_23.3	0.058651	0		

environmental factors. Increased female relative abundance in Zarrin-Gol Stream may be intercepted as increased environmental stress on the population and higher investment in reproduction in the stream. Gholizade *et al.* (2009) reported that fish population of *C. c. gracilis* had a range between 39-151 mm and maximum relative abundance was in length group 67-81 mm and larger fish had low number in Zarrin-Gol Stream. Rezaei *et al.* (2008) has shown maximum frequency of *C. c. gracilis* in length groups between 60-100 mm in Madarsoo stream. In this study, specimens ranged from 4 to 23.3 cm and maximum relative abundance was in the range of 8.9-10.1 cm and 7.7-8.9 cm for males and females respectively. The inter-basin differences in maximum length and weight of the fish may be due to different availability of food resources, growth rate and natural selections that favors larger size in some rivers by Patimar *et al.* (2009).

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