



Age structure and pyramid of *Cirrhinus mrigala* (Hamilton, 1822) from the tributary of the Ganga river, India

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Abstract

Age structure of a population represents the ratio of the various age classes in a population to each other at a given time. Age structure is a function of growth and death. Study was undertaken the period November 2015 to October 2016 from the tributary of the Ganga river (Ghaghra river). The total length of fishes varied from 15.7 to 88.7 cm in 0+ to 8+ age classes. The age structure of *C. mrigala* indicated that the 2+ age group was dominated in the exploited stock from the Ghaghra river at Faizabad. The age classes 0+ and 1+ shared 9.03% and 16.51%, respectively. The bell shaped age pyramid was recorded.

Keywords: Age structure, age pyramid, fish stock, Ghaghra river, *Cirrhinus mrigala*

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1. INTRODUCTION

Fish meat is considered a white meat [1-2]. Fish meat is high in protein; it is almost completely protein. *Cirrhinus mrigala* was the dominant fish species in riverine ecosystem in 20th century [3-4] while in 21th century it is backbone of culture fishery in India [5-6]. These stock and abundance are suffering by invasion of exotic fish species and fishing pressure [7-9]. It fishery and biology are disturbing by various stressors from the Ganga basin [10-14].

Age structure is mostly considered one of the vital characteristics determining the suitability of the ecosystem for the health of fishes [15]. The age structure may also determine resilience [16]. Exploitation typically causes a loss of older individuals [17]. Age and growth of *C. mrigala* studied by various researchers [18-21] but age structure is not discussed by any researchers from the Ghaghra river, India.

2. MATERIAL AND METHODS

Study was carried out between the periods November 2015 to October 2016 from the Ghaghara river at Faizabad district, India. The key scales were used for the determination of *Cirrhinus mrigala* age. Age structure was determined on the basis of annuli and designated as 1+, 2+, 3+ The total numbers of annuli were recorded in each scale to assess the age of an individual fish. This was also done to compute age structure in different sex. In order to determine the age structure, the frequency was computed for each age class and recorded as percentage. Age pyramid prepared by Odom method [22].

3. RESULT AND DISCUSSION

The fishes varied from 0+ to 8+ age classes from the Ghaghra river, India. The age structure of *C. mrigala* indicated that the 2+ age group was dominated in the exploited stock from the Ghaghra river at Faizabad. The age classes 0+ and 1+ shared 9.03% and 16.51%, respectively (Table 1). The age classes 3+ to 8+ contributed 18.07%, 12.77%, 9.03%, 4.98%, 1.87% and 0.62%, respectively. The survival and age distribution of *C. mrigala* are greater in the Ganga basin [23] and also sharing huge proportion in case of Indian major carp group [24]. [25] reported that the 1+ age group was dominated in *Cyprinus carpio* from the Yamuna river at Allahabad, India. Fishing pressures generally remove old individuals from stocks and reducing age structure.

The bell shaped age pyramid was recorded in case of *C. mrigala* from the Ghaghara river at Faizabad. The proportion of immature fishes was lower compared to mature (Fig 1). [3] bell shape age pyramid was recorded in *Tor tor* from the Paisuni and Tons rivers. The urn shaped age pyramid was found in *C. carpio* from the Yamuna river [25].

The age structure of the fishes confirms sign of anthropogenic disturbance and are not indicative of a failure in the reproduction of a particular species [26-28]. The age structure also represents the food structure and supply and environmental condition of the ecosystem [29-31]. In general, age structures of fishes are altering by fishing pressure and multi-stressors [32-34].

Table 1. Age structure of *Cirrhinus mrigala* from the Ghaghra river, India

S. No.	Age classes	Number of fishes	Percentage
1	0+	29	9.03
2	1+	53	16.51
3	2+	87	27.10
4	3+	58	18.07
5	4+	41	12.77
6	5+	29	9.03
7	6+	16	4.98
8	7+	6	1.87
9	8+	2	0.62

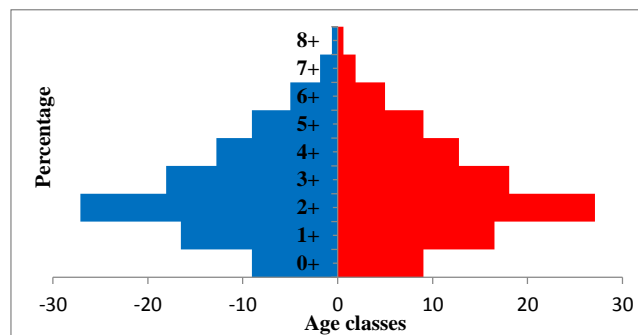


Fig. 1. Age Pyramid of *Cirrhinus mrigala* from the Ghaghra river India

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