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Original Research Article

COMPARITIVE STUDY OF POPULATION STRUCTURE OF GOLDEN MAHSEER (*TOR PUTITORA*) IN BABA DANSAR STREAM AND JHAJJAR STREAM, TWO MAJOR TRIBUTARIES OF RIVER CHENAB (JAMMU)

Bipu Khajuria*, Seema Langer

Department of Zoology
University of Jammu, Jammu (J&K), 180006, India.

Abstract:
Tor putitora is an important food as well as game fish of India. The present study was carried out to investigate the population structure and CPUE of golden mahseer from Baba Dansar and Jhajjar stream. The mean length of fishes ranged between 8.0 to 20 cm in Baba Dansar stream and 9.2 to 18 cm in Jhajjar stream. The CPUE recorded in both the stream ranged between 4.9 to 11.8 with maximum abundance in Baba Dansar stream (11.8) with an overall contribution of 30% record of mahseer in Baba Dansar stream and 15% in Jhajjar stream. The main aim of this study is to evaluate the present status of golden mahseer in both these streams.

Key Words: Population abundance, *Tor putitora*, quantitative, productivity.

Introduction:

The country is endowed with vast and varied resources possessing river ecological heritage and rich biodiversity. Freshwater fishery sites are varied like 45,000 km of rivers, 1, 26,334 km. of canals, ponds and tanks 2.36 million hectares and 2.05 million hectares of reservoirs. The assessment of fresh water fishes is done mainly on the basis of 6 drainage systems in the country. These are Indus river system, Upland cold-water bodies, Gangetic river system, Bramhaputra river system, East flowing river system and West flowing river system. The present study was carried out mainly on River Chenab and its tributaries with special emphasis in Jhajjar and Dansar tributary.

For Correspondence:
khajuriabipu@gmail.com
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The Himalayan mahseer is considered as most important game fish of India. It occurs in different parts of India in cold water rivers and streams of foot hills of Himalaya. The fish performs migration upstream during its breeding period[1]. The golden mahseer thrives well in Jammu waters but is no longer found in Kashmir due to built up Mangla dam which prevents fish from migration[2]. The National Commission on Agriculture in its report stated that there was general decline in mahseer fishery due to indiscriminate fishing of brooders and juvenile and adverse effects of

river valley projects[3]. The mahseer population is rapidly declining from last few decades and is regarded as threatened fish of India. Studies on biological studies of mahseer have been carried by various scientists [2, 4,5,6,7,8,9,10,11.]

Present communication aims to ascertain the population status of Golden mahseer in two major tributaries of River Chenab. According to Elliot data on population status can be obtained from field trips for long term investigations of natural populations[12]. The fishes are also sensitive indicator of relative health of aquatic ecosystem and their surroundings[13]. In general, fishes are continuously removed for various purposes from natural population and as a result the abundance of a species observes a decline[14].

Material and Methods:

The present study was carried out for one year from March, 2012 to Feb., 2013 in Jhajjar stream and Baba Dansar stream, major tributaries of River Chenab. Monthly collections of fishes were done from different sites of stream with the help of cast net. The fishes collected were measured for total length and their respective weights and then counted for their abundance per catch. The fishes were then returned back to water after use while some of fishes were fixed in 10% formalin and brought to laboratory for further study. The population abundance was calculated as:

$$\text{Population abundance} = \frac{\text{Total catch}}{\text{Sum of efforts}}$$

While sum of efforts remained 10

Results and discussion:

Population study of *Tor putitora* was conducted to ascertain the status of *Tor* species in two perennial tributaries of River Chenab viz. Jhajjar and Baba Dansar stream. Overall scenario that emerges after one year long collection made in the two water bodies reveal that the density of the species under investigation is significantly high at Dansar stream (particularly during spring) as compared to Jhajjar stream (Table 1). Prevailing high density during spring is obvious due to the fact that all the abiotic as well as biotic parameters during this phase are quite favourable. During the month of March–April the population abundance of *Tor putitora* is at peak (Table 1) which directly signifies the favourable conditions for the fish. The temperature of the water for most of the time remained within tolerable limits (20-22^{0}C) and food was also available in abundance during the spring season. Fishes being omnivore, consume both animal matter (including insects, rotifers and nauplius larvae) and the plant matter. Moreover during these months catch comprised usually of smaller size fishes ranging between 6cm-12 cm. Large sized fishes however, could be collected only when fishing operation was categorically conducted in deeper water zones.

S.NO	MONTH	CPUE (BABA DANSAR STREAM)	CPUE(JHAJJAR STREAM)
1	March-April	11.8	5.6
2	May-Jun	6.0	6.0
3	Jul-Aug	8.2	5.8
4	Sept.-Oct	9.0	6.4
5	Nov-Dec	8.7	6.6
6	Jan-Feb	3.9	4.9

Table I: CPUE of *Tor putitora* in Baba Dansar Stream and Jhajjar stream (March 2012- Feb. 2013)

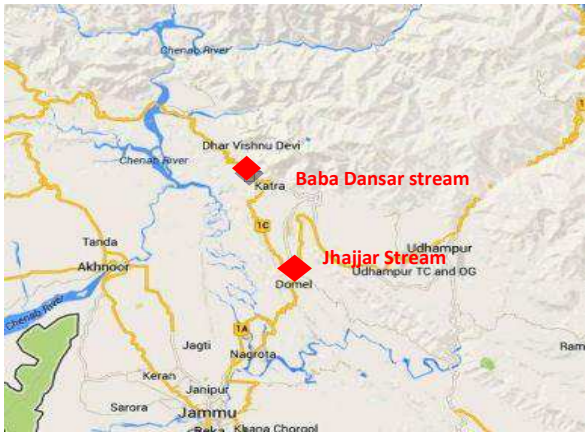

Fig I: Study Area

In May-Jun 2012 the population abundance again falls (6.0) due to low level of water in the stream (evaporates in summer) which directly leads to rise in water temperature and all the critical conditions start appearing before the onset of monsoons. On the onset of monsoon (July-August 2012), the water level rises and temperature of water falls down which favours the fishes to come out from deep pools and ditches in open waters for feeding purpose and to prepare themselves for upcoming breeding season. This time is best for the fishermen to catch the fishes as the fishes of much larger size are easily catchable without much effort. During September- October (breeding season of the fishes) fishes start moving up streams which again accounts for observed increase in CPUE values (8.2 in Sept-Oct to 9.0 in Nov-Dec). In winters (Jan-Feb 2013), however the value of CPUE is least (3.9) as the water temperature falls to 15-16^{0}C which is quite low for fishes to survive in open waters, the fishes therefore prefer to move back to deep pools and ditches where preferably the water temperature is comparatively higher.

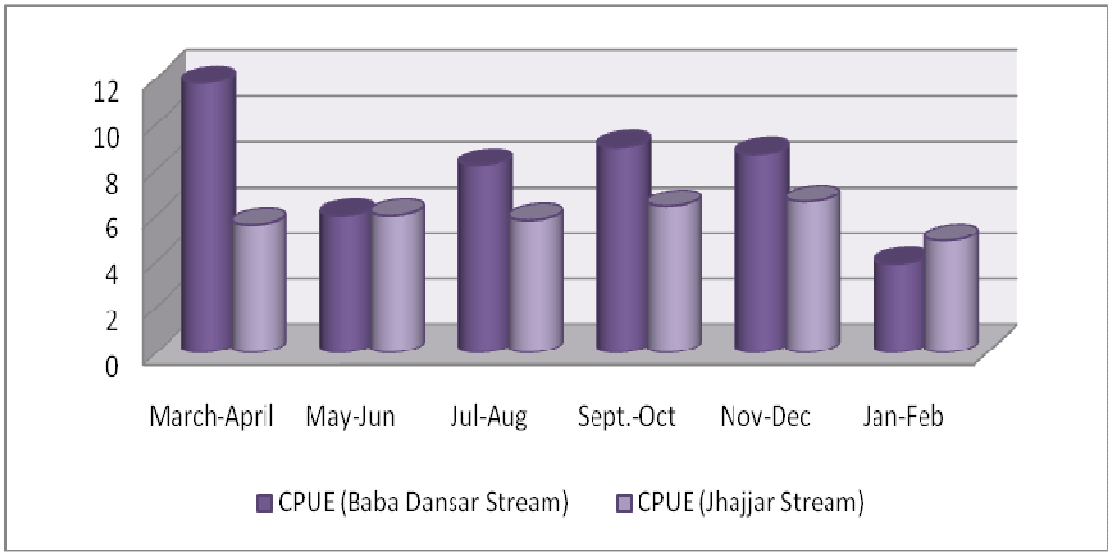

Figure I: Abundance of *Tor putitora* in Baba Dansar stream and Jhajjar Streams

When a comparison was drawn between Baba Dansar stream and Jhajjar stream, the CPUE value of Jhajjar stream was quite low which could never cross 6.6 and is very less as compared to Baba Dansar stream (11.8). The reason for such low CPUE value in Jhajjar stream seems to be a consequence of road construction activity as a large stretch of fluvial system has been transformed from rapid cascade into pool of sluggish water. Because of the various activities going on, other section has also taken the shape of turbid, shallow pools and ditches that previously happen to be a wide and clear stream of water. The composition of bottom substrate has been drastically altered by the road construction and maintenance activities, which now contain a bulk of sand, gravel and stones.

Jhajjar stream recorded its highest value during breeding season only i.e. during the months Sept-Dec 2012 (6.4-6.6 as shown in table I). During this period the conditions are fully favourable but CPUE is still very less as compared to Baba Dansar stream which is 8.7. The reason to justify lower CPUE value in Jhajjar stream is quite obvious as it is an open type of stream with major stretch of its water flowing near to roads. Easy access of fishermen to operate netting as well as road connectivity that has made the exploitation of this fluvial system more convenient and therefore leading low CPUE records. Dansar stream, in contrast lies in between the hill that lacks direct approach to the road except for few points. Moreover, Dansar stream is a religious spot where golden mahseer is worshipped and fishing is strictly prohibited. It has therefore emerged as one of the golden Mahseer sanctuary where the fishes of large size as 25-30 cm could be collected.

Conclusion:

Fish productivity largely depends on management of fish stocks. An accurate understanding of nature and fluctuating population of fishery is therefore very important to formulate fisheries development programme. For a better tomorrow we must keep a strong monitoring on the changing environment, as sustainable fishery is not about fishing only. It is therefore, of great concern to save not only fish but also its habitat.

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