



ASSESSING CHANGES IN LENGTH FREQUENCY COMPOSITION OF THE MIGRATORY STOCK OF PUTITOR MAHSEER *TOR PUTITORA* IN THE RIVER ALAKNANDA AT SRINAGAR, INDIA

Upendra Singh* and Prakash Nautiyal

Department of Zoology and Biotechnology

HNB Garhwal University, Srinagar, 246174, Uttarakhand

*Email: upendra481@gmail.com

Abstract: Present investigation was carried out primarily to ascertain if recent hydropower activities especially at Srinagar had affected Himalayan mahseer's (*Tor putitora*) migration into the Alaknanda. Daily catch was observed for the presence of Himalayan mahseer in the river Alaknanda at Srinagar during April to June of 2014. The length-frequency composition was examined during the period of migration in the Alaknanda River. In this duration 43 specimens measuring 26 to 42 cm size were obtained from fishermen. The size groups 25-30, 40-45 cm and 30-35 and 35-40 cm fishes had minimum and maximum frequency, respectively. The size group 25-30 cm decreased from April to June.

Key words: Hydropower, Himalayan mahseer, Migration, Length-frequency

INTRODUCTION

The Putitor Mahseer, a natural inhabitant of the running waters all along the Himalaya is a State fish of some Himalayan states including Uttarakhand. It is a migratory fish that has been reported to be endangered by hydropower development in all Himalayan river systems including the Ganga because the barrages/dams across the rivers block its up and downstream movements which are an essential part of its life cycle, especially for recruitment processes. Earlier the Himalayan mahseer was reported to ascend till Karnaprayag in river Alaknanda and above Tehri in river Bhagirathi. The Himalayan mahseer is known to accomplish its migration in 3 phases that involves the movement of different stages of life history, viz. the sexually mature adults (brooders), individuals on the threshold of sexual maturity (adolescence) and the immature juveniles (Nautiyal, 1997). The adult population inhabits the foothill stretch of the Ganga and migrates upstream into the Alaknanda and Bhagirathi rivers and then moves laterally into the Saung and Nayar for spawning (Fig. 1). The phenomenon of upstream migration is peculiar to Mahseer. The Himalayan

Mahseer begins to appear in daily catches from Alaknanda at Srinagar from March/ April onwards till July. Earlier, several studies on different aspects such as taxonomy, morphology, food and feeding, physiology, distribution, life history stages, length-weight relationships has been done by several scientists (Desai, 1972; Badola and Singh, 1980; Sen and Jayaram, 1982; Nautiyal and Lal, 1984a,b; Langer et. Al., 2013). Present investigation was carried out primarily to ascertain if recent hydropower activities especially at Srinagar had affected its migration into the Alaknanda.

MATERIALS AND METHODS

In present study 43 specimens of *Tor putitora* were recorded from Alaknanda at Srinagar. The total length of each fish was measured and recorded at the site. All fishes were categorized in 4 size groups at 5 cm class-intervals. The range were computed for each size class for different month and expressed as percentage of total number of fishes in that size group.

For comparing the present data literature was reviewed on the aspects of monthly variations in the

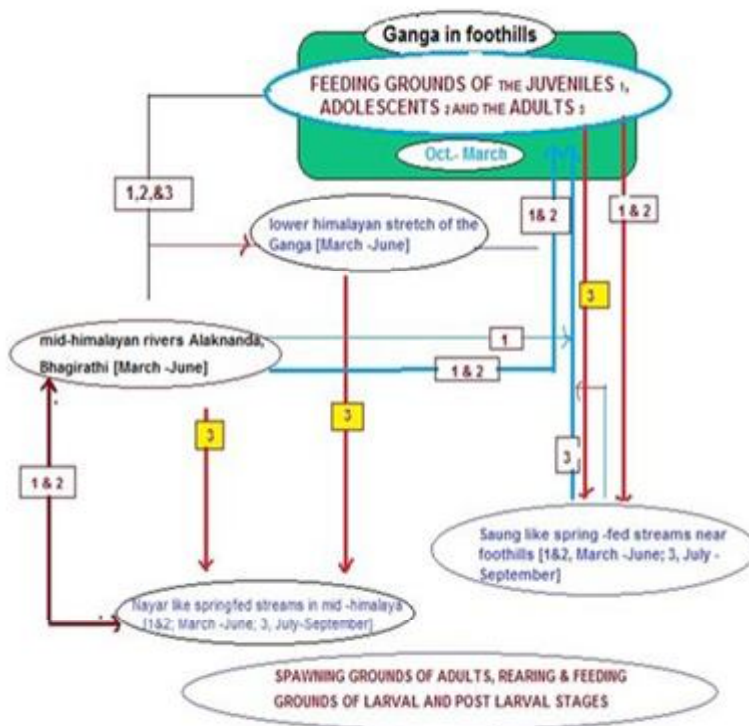


Fig. 1. Migratory movements of *Tor putitora* in the Ganga river system

length frequency (%) distribution of *Tor putitora* during different years in river Alaknanda. Earlier works in this field were those of Badola and Singh (1980, 1984); Sen and Jayaram (1982), Nautiyaland Lal (1982), Nautiyal and Lal (1984), Pathani (1994), Nautiyal (1997), Nautiyal et al. (2001), Nautiyal (2002), Bhatt et al. (2004), Nautiyal et al. (2008), Lakra et al. (2010), and Langer et al. (2013). From these literatures the length data was collected and categorized in 13 size groups at 10 cm class-intervals. The range were computed for each size class for different month and expressed as percentage of total number of fishes in that size group.

RESULTS AND DISCUSSION

The fishes collected measured 26 cm to 42 cm in size during the migratory phase. The length frequency of fishes were different during sampling periods, the two size group 25-30 cm and 40-45 cm fishes had minimum frequency and the rest two group

30-35 cm and 35-40 cm fishes had maximum frequencies respectively (Fig. 2).

The examination of monthly frequencies show, the size group 25-30 cm decreased from 18% in April to 11% in May and was absent in June. The size groups 30-35 cm and 35-40 cm were dominant in each month, increasing 36%, 37%, and 60% respectively. However size group 40-45 cm was scarce (10%) in April, increasing in May (15%) but did not figure in June samples (Table 1).

The present study confirms that the Himalayan mahseer still ascends the Alaknanda at Srinagar. The size in Alaknanda suggests that the prospective brooders along with adolescent and juvenile ascend in this phase. Observations of length frequency distribution of *Tor putitora* in Alaknanda river shows that the size group 11-20 cm was dominant in the month of July in all the years under observation. The size groups 21-30 cm and 31-40 cm were dominant in May and June during all the years. The size group

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