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Note

Comparative study of morphometric characters of Himalayan mahseer *Tor putitora* (Ham.) between Ganga and Gobindsagar reservoir stocks

J. P. BHATT, P. NAUTIYAL AND H. R. SINGH[1]

Department of Zoology, H.N.B. Garhwal University, Srinagar - 246 174 (Garhwal)

ABSTRACT

A study on the morphometric characters of Himalayan mahseer was conducted in the foothill section of the river Ganga and compared it with the Himalayan masheer stock of the Gobindsagar reservoir (Himachal Pradesh). Standard length, head length, length of anal fin length of caudal fin, predorsal distance and preanal distance in proportion to total length, and postorbital distance and preorbital distance in proportion to head length of mahseer of river Ganga and Gobindsagar reservoir were found to be closely related.

The different body proportions of the *Tor putitora* from the Ganga stock have been compared with the earlier published data from the Gobindsagar reservoir (Tandon *et al.*, 1993, Johal *et al.*, 1994).

Fish samples were obtained from Ajeetpur, a major fish landing centre in the foothill section of the river Ganga (a glacier fed river) near Hardwar located at an elevation of 286 m above msl (29° 56' N 78°10' E). The Gobindsagar reservoir of Himachal Pradesh (31°25' N 76°25'E) is one of the large reservoirs of India (Johal *et al.*, 1994). The fish samples of varied sizes were collected at regular monthly intervals from September 1993 to April 1995. The morphometric measurements were made on the basis of description provided by Jayaram (1981) and Srivastava (1992). The following 15 and 5 characters in total and head length respectively, have been studied: (a) *in proportion to total length*: standard length (SL), head length (HL), head depth (HD), length of anal fin (LAF), length of pelvic fin (LPF), maximum body depth (MBD), minimum body depth (MiBD), length of caudal fin (LCF), distance between pectoral and pelvic fine (DPP), distance between pelvic and anal fin (DPA), predorsal distance (PrDD), post dorsal distance (POD), length of dorsal fin (LDF), depth of dorsal fin (DDF) and preanal distance (PAD), and (b) *in proportion to head length*: eye diameter (ED), inter orbital distance (IOD), post orbital distance (POD), head depth (HD) and pre orbital distance (PrOD).

Body proportions were tabulated to obtain the range. The mean values were compared with data from Tandon *et al.* (1993) and Johal *et al.* (1994). The

[1] Present address : Department of Zoology, University of Allahabad, U. P., India.

various morphometric characters were then classified on the basis of range difference into genetically (<10 %), intermediate (10-15 %) and environmentally (>15 %) controlled characters (Johal *et al.*, 1994).

SL, LAF, LCF, and PrDD to the total length were found to be most similar to the Gobindsagar stock while MiBD and PAD differed considerably (Table 1). In proportion to head, POD was mostly similar while HD, ED and POD were more dissimilar. Earlier Bhatt (unpublished) observed that the range difference of SL, LAF, LCF and PrDD in percentage of total length and POD in percentage of head length was <10. They were classified as genetically controlled characters while PAD in percentage of total length and HD and PrOD in percentage of head length were found to be environmentally controlled characters.

Johal *et al.* (1994), reported 13 characters in relation to total length to be genetically controlled. During the present investigations 11 of these characters were found to be genetically controlled. The knowledge of this is important since Vladykov (1934) maintains that in the fish species showing restricted distribution, the majority of morphometric characters show narrow range and are genetically controlled. On

TABLE 1. *A comparison of body proportions of* Tor putitora *between river Ganga and Gobindsagar reservoir* (Mean in parentheses)

Nature of characters	Body characters	Present observation (Ganga)	Johal *et al.*, 1994 (Gobindsagar)	Tandon *et al.*, 1993 (Gobindsagar)
In proportion to total length:				
Genetic characters	SL	1.2-1.3 (1.24)	1.1-1.2 (1.2)	1.1-1.2 (1.21)
	HL	3.7-5.7 (4.5)	4.3-5.4 (4.7)	4.4-5.2 (4.8)
	HD	6.0-10 (8.5)	7.3-10 (8.2)	6.5-8.1 (7.5)
	LDF	8-11.1 (9.7)	3.4-13 (7.8)	9-10.1 (9.6)
	DDF	4.2-6.8 (5.43)	2.9-7.9 (6.6)	6.0-7.6 (6.5)
	LAF	13.8-25.6 (17.8)	13.2-21 (17.8)	16.1-22 (17.5)
	LPF	6.8-10 (7.6)	7.3-9.8 (8.4)	8.1-9.4 (8.6)
	MBD	4.3-7.4 (6.13)	4.2-6.7 (5.6)	4.8-5.5 (5.1)
	MiBD	8.3-15.8 (11.9)	11.3-14.4 (12.8)	10.8-12 (11.6)
	LCF	3.7-5.9 (4.6)	4-5.5 (4.6)	4.3-5.1 (4.7)
	DPP	3.41-6.2 (5.25)	4.2-5.5 (4.7)	4.4-5.2 (4.6)
	DPA	3.63-5.0 (4.87)	4.2-6.8 (4.8)	4.9-5.5 (5.2)
Intermediate	PrDD	2.2-3.03 (2.55)	2-2.7 (2.5)	2.5-2.7 (2.6)
	PDD	2.8-4.1 (3.62)	2.7-3.9 (3.3)	21-2.2 (2.2)
Environmental	PAD	1.4-1.8 (1.62)	1.3-1.7 (1.74)	1.6-1.73 (1.65)
In proportion to head length:				
Intermediate	ED	4.4-8.3 (6.5)	4.5-10 (7.1)	5.1-6.7 (5.9)
	IOD	2.4-3.5 (2.90)	2.7-5.7 (3.0)	2.8-3.4 (3.09)
	POD	1.6-2.2 (1.9)	1.6-2.2 (1.80	1.7-1.9 (1.8)
Environmental	HD	1.6-2.2 (1.9)	1.4-2.0 (1.7)	1.3-1.7 (1.5)
	PrOD	2.3-3.6 (3.0)	2.5-4.4 (3.1)	2.6-3.2 (2.9)

the contrary in species which have a wide range of zoogeographical distribution, most of the characters are strongly influenced by the environment. There were greater similarities in the genetically controlled characters while more dissimilarities in the environmentally controlled characters.

Despite difference in location of Gobindsagar reservoir and Ganga at Hardwar some characters exhibited striking resemblance, most of which were classified as genetic and intermediate characters (SL, LAF, LCF, PrDD in relation to total length and POD in relation to head length). Only PAD in total length and PrOD in head length were environmentally influenced characters. HL can also be included in this category as it is an important diagnostic character. These characters can be used to compare other populations of the Himalayan masheer and to study the tendency of subspeciation, if any.

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