



New record of Loach fish (Cypriniformes: Nemacheilidae) from Himachal Pradesh, Trans Himalayan Ecosystem, India

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Abstract

Loaches (*Triplophysa* spp.) of the family Nemacheilidae are ecologically significant, endemic and zoogeographically important fishes of the Trans Himalayan Ecosystem of India. These fishes mostly have not evaluated by the IUCN and also not included under the Wild Life (Protection) Act of 1972. *Triplophysa tenuicauda* (Steindachner, 1866) has been reported for the first time from the cold desert province of state Himachal Pradesh.

Keywords: Cold Desert, Ecosystem, Spiti Valley, Trans Himalayan

Introduction

The Spiti Valley, Lahaul and Spiti is situated in the Trans Himalayan Ecosystem of the north-eastern part of Himachal Pradesh. It is positioned between North Latitude 31° 44' 57" and 32° 59' 57" and between East Longitude 76° 46' 29" and 78° 41' 34". Its altitude ranges from 3090 to 6500m ASL and has an area of 7,589 km². It is one of the isolated, least populated desert mountain valleys and one of the most fragile ecosystems in the world. The region is characterised by very high barren mountains, valleys and narrow gorges. The barren landscapes of the valley are covered with peaks of snow and naked mountains are carved with magnificent colours of nature. It is situated in the rain shadow area of the rugged mountain ranges of Zaskar and the Great Himalayas. The air is very dry and the winds are very strong. Vegetation in the Spiti Valley is less & sparse and mostly confined to valleys and occupant places. The area is mostly snow-bound and landlocked for about eight months *i.e.* from October to May. **The Spiti River** (glacier-fed) along with its various tributaries traverses throughout the valley.

Spiti River valley is about 185 km (constitutes of two almost equal basin-Spiti and Parachu) and is a tributary

of River Satluj. The river originates from the *Nogpo-Topko* glacier located near Kunzum La (4551m ASL) as the Taktisistream and joins with the Pagnu and Kibji rivers and thereafter called the River Spiti. Afterwards, River Spiti flows through a distance of about 150 km and joins the River Satluj at Khab. In the entire course the River Spiti fall down about 1800 m with an average slope of 17m/km. It has a catchment of 9660 km² with nearly 50% of the River Parachy, a tributary of River Spiti (Phartiyal *et al.*, 2009).

Loaches (*Triplophysa* spp.) are small-sized benthic fishes and inhabit in clear, torrential and oxygenated water of hill streams. These fishes belong to the family Nemacheilidae or stone loaches in the Superfamily Cobitoidea. Menon (1987) placed Nemacheilidae as a subfamily under the family Homalopteridae. Kottelat (1988) named the family *Balitoridae* instead of *Homalopteridae*. Subsequently, Kottelat (2012) placed *Nemacheilinae* in the family level *Nemacheilidae* and separated it from *Balitoridae* after evaluating the taxonomy and nomenclature of the fishes of the superfamily *Cobitoidea*. It is one of the large families and contains 720 species (Eschmeyer *et al.*, 2018) under the family Nemacheilidae. There are 131

recognized species in the genus *Triplophysa* (Kottelat, 2012) worldwide and 10 species in India (Menon, 1987). Banarescu and Nalbant (1968), Ren *et al.* (2012), and Zhu (1989) reported that the *Triplophysa* genus is identified based on sexual dimorphism, *i.e.*, an area of breeding tubercles between snout and eyes on each side of the head, a thickened tuberculate pad on the dorsal surface of the outer broadened pectoral-fin rays of males and adjacent anterior and posterior nostrils.

Pertinent literature reveals that fishes of the Trans Himalayan Ecosystem of Spiti valley, district Lahaul and Spiti have been worked out only by a few workers *viz.* Mehta and Sharma, 2008 Sharma and Dhanze, 2013. Total three indigenous species *viz.* *Triplophysa microps* (Steindachner, 866), *T. stolickai* (Steindachner, 1866) and *Schizothorax richardsonii* (Gray, 1832) have been reported from the area (Sharma, 2018). Thus, with the present communication the number of species, known from Spiti Valley goes to four. The diversity found in this province is less but unique and shows Palearctic affinities.

Materials and Methods

Two fish specimens were collected during the surveys conducted of Spiti Valley, district Lahaul and Spiti from 2012 to 2014. The specimens were preserved in 7% formalin. Morphological and meristic characteristics were studied for the identity of the fish following Talwar & Jhingran, 1991 and Jayaram, 1999. These specimens have been registered under Registration No. F-989. Measurements were made point-to-point with digital calipers to the nearest 0.1 mm and expressed as percentages of Standard Length (SL) and Head Length (HL). Counts and measurements were made on the left side of specimens whenever possible. Fin rays and scales were counted under a binocular stereo-zoom microscope. Methods for counts and measurements follow (Ng & Dodson, 1999). The specimens are deposited in the National Zoological Collections of High Altitude Regional Centre, Solan (HARC/ZSI/F/989).

Result

The present studies report the first occurrence of the species *Triplophysa tenuicauda* (Figure 1) of the family Nemacheilidae from Losar in Takacha River (4120 m ASL) of the Spiti Valley, district Lahaul and Spiti (H.P.). The Systematic account of the fish is as follows:



Figure 1. *Triplophysa tenuicauda* (Steindachner, 1866).

Order: Cypriniformes Bleeker, 1859

Family: Nemacheilidae Regan, 1911

Genus: *Triplophysa* Rendahl, 1933

Genus/Species: *Triplophysa tenuicauda*
(Steindachner, 1866)

1866. *Cobitis tenuicauda* Steindachner, *Verhandlungen der K.-K. zoologisch-botanischen*

Gesellschaft in Wien, pl. 17 (Fig. 3) v. 16: 792 (type locality: Stream near Hanle monastery, Hanle, Tibet).

1991, *Triplophysa tenuicauda*, Talwar and Jhingran, *Inland Fishes*, 1: 515

Common name: Tibetan Stone Loach

Material examined: 02 exs., Losar, Takcha, Spiti Valley, Lahaul & Spiti, Coll. A. Kumar and Party, 16. xi. 2018, Regd. No. 989

Diagnostic characters: Elongated, narrow body having a long and whip-like tail. Head pointed and comparatively broader than height. Eyes are not very small but not visible from the ventral surface of the body. Nostrils situated nearer to the eye than the tip of the snout. Mouth semicircular, lips fleshy, deeply furrowed, upper lip uninterrupted and lower lip interrupted in the middle. Barbels are well developed. The dorsal fin is inserted nearer to the base of the caudal fin than to the snout tip. The pelvic fin is situated opposite to the dorsal fin. The length of the head is almost equal to the pectoral and caudal fin length. Caudal fin truncate, narrow and long. Scales absent; lateral line complete. Body and flanks were spotted with brownish colour and distinct russet spots occurred all along the lateral line of the body. Morphometric data of the specimens has been recorded (Table 1).

Distribution: India: Ladakh (UT), Losar, *Takacha River-Spiti Valley, district Lahaul and Spiti (H.P.)*- Present Record; Elsewhere: Pakistan, China.

Table 1. Morphometric data of *Triplophysa tenuicauda* (Steindachner, 1866)

S.No.	Characters	Measurements (mm)	
Morphometric		F-989	F-989
1	Total Length	56	52
2	Standard length	48	44
3	Head length	8.6	8
4	Width/height of Head	4.8	4.6
5	Eye diameter	2.4	2.2
6	Depth of body	6.3	6.1
7	Length of dorsal fin	7.8	6.6
8	Length of pectoral fin	8.4	7.8
9	Length of pelvic fin	11.9	11
10	Distance between pelvic and anal fin	6.0	4.8
11	Caudal fin length	8.4	8.2
12	Caudal peduncle length	10.9	10.6
(in the ratio of) Standard length			
13	Pre-dorsal length	22.2	21
14	Post-dorsal distance	21.2	20.2
15	Pre-pectoral length	11.4	10.2
16	Pre-pelvic distance	22.8	21.6
17	Pre-anal length	29.6	28.4
(in the ratio of) H. L.			
18	Snout length	4.3	3.6
19	Eye diameter	2.4	1.1
Meristic			
20	Dorsal spines	3	3
21	Dorsal fin rays	7	7
22	Pectoral fin rays	10	10
23	Pelvic fin rays	8	8
24	Anal fin rays	5	5
25	Caudal fin rays	15	15

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