

## ***Sisor pakistanicus* (Teleostei, Sisoridae), a new catfish from the river Chenab, Pakistan**

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### **ABSTRACT**

Whiptail catfish collected from the river Chenab at Trimmu head works near Jhang, Pakistan is diagnostically different from previously described *Sisor rabdophorus* Hamilton 1822. The new species is clearly distinct from *Sisor rabdophorus* in having deeper body, longer caudal peduncle, larger eye, shorter interorbital distance, shorter snout, shorter maxillary barbels, smaller inner mandibular barbels, more serrations on the outer and inner face of pectoral spine, less number of lateral line ossicles, wider nuchal plate, longer dorsal spine, less prepectoral distance, shorter anal fin base, longer pectoral spine and deeper caudal peduncle. All of these features justifiably indicate that *Sisor* population of river Chenab is a different species.

**Key words:** Catfish, Sisoridae, *Sisor pakistanicus*, new species.

### **INTRODUCTION**

*Sisor*, the type genus of family Sisoridae was known to be represented by a single species *Sisor rabdophorus* first described by Hamilton (1822), in Ganges (India) and Indus river system, Pakistan (then a part of India). Cuvier & Valenciennes (1840) suggested correction in the name and used *rhabdophorus* instead of *rabdophorus*. Day (1877, 1889) described the same species from India and adjacent countries. Ahmad (1943) recorded *Sisor rabdophorus* from Lahore. Mirza (1970) recognized *S. rabdophorus* from Pakistan, including Punjab, Sind, East Pakistan (now Bangla Desh) and India. Mirza (1975) discussed *Sisor rabdophorus* in the submontane areas in the Indus plain. Mirza & Sharif (1996), Mirza (2003) and Mirza & Sandhu (2007) described the occurrence of *Sisor rabdophorus* in Punjab and Sind. Talwar & Jhingran (1991) and Jayram (1999) regarded it as the only *Sisor* species from Ganges and Yamuna river systems in India and Bangla Desh and Indus river system in Pakistan. Ng (2003), after examining fresh and preserved material from India, revised and split the previously monotypic genus *Sisor* into four species on the basis of body depth, snout length, eye size, shape of the nuchal plate, no. of pectoral spine serrations and lateral line ossicles. Recently collected specimens from river Chenab differ greatly from earlier descriptions available.

### **MATERIALS AND METHODS**

Four specimens were collected from the river Chenab at Trimmu head works, near Jhang. Specimens were collected from shallow water from underneath the stones. Three specimens were caught by hand and another one was stuck in the net having 1cm holes. Specimens were fixed in 10% commercial formalin in the field, transported to laboratory, photographed and preserved in 70% ethyl alcohol.

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Measurements were made with calipers up to the accuracy of 1/20th of a millimeter (0.05mm). Dissecting binocular microscope (KYOWA) made in Tokyo, Japan having magnification 20X and 40X was used for minute observations like lateral line ossicles, serrations on spines, dimensions of nuchal plate and fin rays etc. Procedure for most of the measurements followed Ng and Ng (2001) and H. H. Ng (2003). Measurements and counts were taken from both left and right sides of the body and for accuracy, mean value or range is mentioned. Lengths, widths or heights are mentioned mainly as percentage of standard length (SL) and/or head length (HL).

## RESULTS

### *Sisor pakistanicus* sp. nov.

Holotype: 81mm SL. Department of Zoology, Government College University, Lahore, Pakistan.

Paratypes: (3) 93mm, 89mm and 84mm SL.

Common name: Kirla (local), Whiptail (English)

### Diagnosis

It can easily be distinguished from *Sisor raddophorus* and other species of *Sisor* found in the Ganges-Brahmaputra drainage system by following diagnostic characters: 58 – 62 Lateral line ossicles, 42 – 45 and 17 – 18 serrations on anterior and posterior edges of pectoral spine respectively, deeper body (maximum 8.7 – 10.11, at anus 6.52 – 7.4 of SL), large eye (16.05 – 18.24% of HL) and wider nuchal plate (W/L: 1.44 – 1.66)

### Description

Fin formula: D. I, 6; P. I, 9; V. I, 6; A. ii, 4; C.5/6

It is a small sized fish with head and anterior part strongly depressed while posterior part is compressed laterally. Dorsal profile is slightly convex; ventral surface is almost flat up to the vent; caudal peduncle narrow and long.

Head is greatly depressed; longer than broad and broader than high; its length 20.05 – 20.65% of SL; its width 51.07 – 57.69 % of its length and 15.48 – 16.30 % of SL; depth of head equal to or slightly less than maximum body depth but more than body depth at anus; head depth 51.07 – 57.69 % of breadth, 33.95 – 44.11 % of its length and 8.03 – 9.78 % of SL. Snout is broad and round in front; its length 44.12 – 49.02 % of HL and 9.26 – 9.78 % of SL. Nostrils of each side close together, separated by a small flap; nostrils are closer to the eye than to the tip of snout. Interorbital distance slightly greater than diameter of eye, 18.42 – 18.53 % of HL and 3.71 – 3.89 % of SL. Eyes small, almost in the middle of head; its diameter 16.05 – 18.24 % of HL and 3.32 – 3.83 % of SL. Occipital process is extended backward in the form of a long and narrow spine up to the nuchal plate; its length 25.72 – 28.01 % of HL.

Body depth is maximum just in front of the dorsal fin; 8.7 - 10.11 % and at anus 6.52 - 7.4 % of SL (standard length). Dorsal fin situated at about anterior 1/3<sup>rd</sup> of the body; pre-dorsal distance 30.34 - 31.48 % of SL. Anal fin at about anterior 2/3<sup>rd</sup> of the body; pre-anal fin length 62.92 - 66.3 % of SL. Anus is located in the anterior half of the body situated between the pelvics at about their middle level; pre-anus length 42.39 - 43.83 % of SL. Paired fins are horizontal, pectorals reaching the origin of pelvics; pre-pectoral length 13.04 - 14.61 % of SL. Pelvic fin is inserted behind dorsal fin; prepelvic length 34.78 - 35.74 % of

SL. Base of dorsal is 12.92 - 13.1 % of SL and 61.77 - 63.58 % of HL. Length of dorsal spine is almost equal to the base of dorsal; it is 12.58 - 13.58 % of SL and 62.75 - 84.71 % of HL; its anterior face is denticulated, having 20 - 25 small serrations. Anal fin is short; its base almost half of its length; its base 4.94 - 5.62 % of SL and 23.53 - 26.32 % of HL. Pectoral fin is slightly longer than head; its length is 20.79 - 22.22 % of SL; length of pectoral spine is 19.64 - 20.99 % of SL; both edges of pectoral spine are serrated having 42 - 45 serrations on anterior and 17 - 18 serrations on its posterior edge. Length of pelvic fin is 13.1 - 14.67 % of SL and 66.47 - 72.83 % of HL. Caudal peduncle is slender and long tapering towards the base of caudal fin; its maximum depth, behind the anal fin base is 3.37 - 3.57 % of SL; its least depth, just in front of the caudal fin is 7. 20 - 7.5 % of its length and 2.14 - 2.22 % of SL. Caudal fin is shorter than dorsal, pectoral and pelvic but longer than anal; its length 11.73 - 12.92 % of SL and 55.88 - 64.42 % of HL.

Circumoral barbels six pairs; maxillary barbels more than half of head, reaching the posterior margin of eye; its length 55.26 - 58.82 % of HL. There is a pair of very small inner mandibular barbels; its length is 10.53 - 14.71 % of HL. Outer mandibulars form four (4) interlocked lobes, united at the base; their length 10.53 - 14.71 % of SL. Branchiostegal rays six (6). Gill membranes united to isthmus.

There are 58 - 62 lateral line ossicles; in the midline behind the dorsal are 6 - 10 sharp edged bony plates; last plate is extended backwards in the form of a small, sharp spiny structure. Nuchal plate is considerably wider than long, having narrow central process. Its width is 1.44 - 1.66 times of its length.

**Fin rays:** Dorsal I, 6; pectoral I, 9; Pelvic i, 6; Anal ii, 4; caudal 5/6. First ray of upper lobe of caudal fin is greatly extended in the form of a long filament.



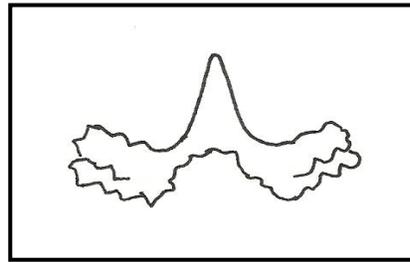
(a)



(b)



(c)



(d)

**Fig., 1:** a) Lateral view b) Ventral view c) Dorsal view d) Nuchal Plate

**Table 1: Comparison of morphometric characters and meristic counts of *Sisor pakistanicus* and *Sisor rabdophorus* (as in H. H. Ng., 2003)**

	<i>Sisor pakistanicus</i> sp. nov.		<i>S. rabdophorus</i> Hamilton 1822
	Holotype	Range	Range
Standard Length (mm)	81	81 - 92	46.8 – 90.3
<b>In % Standard Length</b>			
Body depth at anus	7.4	6.52 – 7.4	5.0 – 5.4
Body depth max.	9.26	8.33 – 10.11	Not available
Pre-dorsal length	31.48	30.34 – 31.48	28.5 – 35.2
Pre-pectoral length	14.2	13.04 – 14.61	15.3 – 18.5
Pre-pelvic length	35.19	34.78 – 35.74	32.1 – 35.9
Pre-anal fin length	65.43	62.92 – 66.3	60.0 – 67.2
Pre-anus length	43.83	42.7 – 43.83	Not available
Length of dorsal base	12.96	12.92 – 13.1	11.6 – 13.5
Length of dorsal spine	13.58	12.58 – 13.58	9.0 – 10.1
Length of anal base	4.94	4.94 – 5.62	7.2 – 8.7
Length of pelvic fin	14.2	13.1 – 14.67	14.2 – 17.4
Length of pectoral fin	22.22	20.79 – 22.22	20.1 – 23.5
Length of pectoral spine	20.99	19.64 – 20.99	17.1 – 19.3
Least depth of caudal peduncle	2.22	2.14 – 2.22	1.6 – 2.0
Maximum depth of caudal peduncle	3.40	3.37 – 3.57	Not available
Length of caudal peduncle	30.86	28.57 – 30.86	22.9 – 26.4
Length of caudal fin	11.73	11.73 – 12.92	12.3 – 15.5
Head length	20.24	20.05 – 20.65	19.1 – 22.6
Head width	16.30	15.48 – 16.30	15.1 – 17.7
Head depth	9.25	8.03 – 9.25	8.20 – 9.40
Snout length	9.26	9.26 – 9.83	Not available
Eye diameter	3.83	3.32 – 3.57	Not available
<b>In % Head Length</b>			
Snout length	44.12	44.12 – 49.02	53.90 - 55.70
Interorbital distance	18.53	18.42 – 18.53	20.6 – 22.8
Eye diameter	18.24	16.05 – 18.24	9.4 – 12.2
Length of occipital spine	25.88	25.72 – 28.01	Not available
Pre-nostril length	27.53	27.17 – 31.05	Not available
Base of dorsal fin	61.77	61.77 – 64.43	Not available
Base of anal fin	23.53	23.53 – 28.01	Not available
Length of dorsal spine	64.71	62.75 – 64.75	Not available
Length of pelvic fin	67.65	66.48 – 72.83	Not available
Length of caudal fin	55.88	55.88 – 64.42	Not available
Head breadth	76.47	75.15 – 78.43	Not available
Head depth	44.11	38.95 – 44.11	Not available
Length of maxillary barbels	58.82	55.26 – 58.82	59.0 – 73.9
Length of inner mandibular barbels	14.71	10.53 – 14.71	42.7 – 54.0
Length of outer mandibular barbels	47.0	44.74 – 47.0	42.2 – 63.9

Table 1: Continued ....

	<i>Sisor pakistanicus</i> sp. nov.		<i>S. rabdophorus</i> Hamilton 1822
	Holotype	Range	Range
Head depth in % of Head breadth	57.69	51.07 – 57.69	Not available
Least depth of caudal peduncle in % its length	7.20	7.20 – 7.50	Not available
Lateral line ossicles	60	58 - 62	66 – 70
<b>Fin ray counts:</b>			
Dorsal	I, 6	I, 6	I, 6
Pectoral	I, 9	I, 10	I, 10 or I, 11
Pelvic	i, 6	i, 6	i, 5-7
Anal	ii, 4	ii, 4	ii, 4
Caudal	5/6	5/6	5/6-7
Serrations on anterior edge of pectoral spine	45	42 - 45	27 – 29
Serrations on posterior edge of pectoral spine	17	17 - 18	6 - 15
Serrations on dorsal spine	21	20 – 25	Not available
Bony plates behind dorsal	6	6 - 10	6 - 10
Nuchal plate W/L	1.62	1.44 – 1.66	1.2 – 1.3

## DISCUSSION

Various morphological and meristic traits which are of diagnostic value and are a consistent feature within a species, clearly indicate that the *Sisor* population of the river Chenab is a distinct species. It can be distinguished from the *Sisor rabdophorus* described by Ng. (2003) in many aspects of taxonomic value. It has a deeper body; depth at anus is 6.52 – 7.4 % of SL compared to 5.0 – 5.4 %. Pectoral fin is a little forward; pre-pectoral length is 13.04 – 14.61 % of SL, compared to 15.3 – 18.5 %. Dorsal spine is longer, 12.58 – 13.58 % compared to 9.0 – 10.1 % of SL. Anal base is shorter, 4.94 – 5.62 % compared to 7.2 – 8.7 % of SL. Pectoral spine is longer, 19.88 – 20.00 % compared to 17.1 – 19.3 % of SL; 42 – 54 serrations on its anterior edge and 17 – 18 on posterior edge compared to 27 -29 and 6 – 15 respectively. Caudal peduncle is relatively deeper and longer; its least depth is 2.14 – 2.22 % of SL compared to 1.6 – 2.0%; length of caudal peduncle is 28.57 – 30.86 % of SL compared to 22.9 – 26.4%.

Snout is slightly shorter, 44.12 – 49.02 % of HL compared to 53.9 – 55.7%. Eye is relatively larger; its diameter is 16.05 – 18.24 % of HL compared to 9.4 – 12.2 %. Interorbital distance is narrow, 18.42 – 18.53 % of HL compared to 20.6 – 22.8 %. Maxillary barbels are shorter, 55.26 – 58.8 % of HL compared to 59 – 73.9 %. There are very short inner mandibular barbels 10.53 – 14.71 % of SL compared to 42.7 – 54.0 %.

Nuchal plate is wider than long, its width 1.44 – 1.66 times its length compared to 1.2 – 1.3; its central process is narrower than *S. rabdophorus*.

There are much more serrations on anterior and posterior edge of pectoral spine, 42 – 45 and 17 – 18 compared to 27 – 29 and 6 – 15 respectively.

The above discussion leaves little doubt that *Sisor* population at Trimmu in river Chenab is justifiably valid species clearly distinct from *S. rabdophorus* and other related species namely *S. chennuah* in the Brahmaputra River drainage system and *S. rheophilus* and *S. torosus* in the Ganges River drainage system described by Ng. (2003). Hence it is separately named as *Sisor pakistanicus* on the basis of the country name of the collector and the collection.

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