

# Meristic counts of *Puntius sophore* (Hamilton, 1822) and *Puntius chola* (Hamilton, 1822) concerning geographic variations

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## Abstract

The fishes, *Puntius* are tropical freshwater fishes belonging to the family Cyprinidae. Morphometric and meristic characters are helpful in the easy and correct identification of fish species in the laboratory as well as at natural places. This investigation aimed to study the meristic counts to find out geographical variations in the species *Puntius sophore* and *Puntius chola* collected from different localities of the Indian River system [Pennar River, Buckingham Canal, Godavari River, Cauvery River, Palar river, Krishna river, Bhima river, and the Brahmaputra]. The meristic characters of *Puntius sophore* and *P.chola* showed that there were no significant variations between the populations from the various river systems of India.

Keyword: *Puntius chola*, *Puntius sophore*, Meristic characters.

## Introduction

The genus *Puntius* is found throughout India, Bangladesh, Malay Archipelago, Myanmar, Nepal, Pakistan, Sri Lanka, and Thailand; also found in southern continental china and adjacent islands. Nomenclature: -There has been considerable inconsistency and confusion in adopting the name *Barbus* Cuvier, 1817. *Puntius* Hamilton, 1822. Hamilton - Buchanan placed some species under his division *Puntius* and a few others under the division *Cyprinus*.

This group is the most species-rich among the fishes and is oriental in distribution. The *puntius* fishes are commonly called barbs and are widely distributed in South Asia. Intra-specific variability of color pattern coupled, on occasion, with similar inter-specific morphometric and meristic characters have made it very difficult to distinguish between species. The genus *Puntius* is found throughout India, Bangladesh, Malay Archipelago, Myanmar, Nepal, Pakistan, Sri Lanka, and Thailand; also found in southern continental China and adjacent islands. The type species is the pool barb (*Puntius sophore*) first described as *Cyprinus sophore* by Hamilton in 1822 *Puntius sophore* is widely distributed in Indian waters. Many species of *Puntius* are attractive as aquarium fish due to their beautiful coloration, striking body markings, general body shape, and small size as well as the ease of rearing in home aquaria. Most are essentially riverine species, De Silva (1983) and De Silva (1988) but some are also found in the multitude of irrigation reservoirs across the country. Due to high abundance, they contribute significantly to the tropic dynamics of many reservoir ecosystems in the country Weliange W.S and Amarasinghe (2003).

Identification of a species plays a key role in any in-depth study of the species. Different methods are used for the identification of fish but meristic counts and morphometry are considered as the earliest and authentic methods for the identification of species (Naymen, 1965). Meristic counts mean anything that can be counted while, morphometry is the external measurement of body parts/proportions of an organism (Talwar and Jhingran, 1992). Comparing anatomical features of organisms has been a central element of biology for centuries. Both, the taxonomic classification of organisms was historically based on descriptions of morphological forms (Dean *et. al*, 2003). The present study is designed to provide basic data on the external morphology of *Puntius sophore*. To determine whether there are significant morphometric differences between sub-populations from various river systems of India.

## Materials and Methods

The material for the present study was obtained from the Zoological Survey of India (ZSI), Southern Regional Centre, Chennai. The genus *Puntius* was selected as the study material from various river systems and several fishes collected from these localities are mentioned in Table 1a, b.

Table – 1 (a): Sample Collection - Location Site - *Puntius sophore* (Hamilton, 1822)

LOCATIONS	NO. OF FISHES	COLLECTOR	DATE
Pamidi (Pennar River)	20	T.Venkateswarlu	09.04.1986
Andhra (Buckingham Canal)	20	T.Venkateswarlu	05.05.1986

Bhimavaram (Godavary River)	14	Nagaraja Rao	25.03.1995
Vedapuri Natham (Cauvery River)	20	Dr. K.R.Rao & Party	26.03.1992
Ethirmundi Reservoir (Krishna River)	20	K.C.Jayaram & Party	22.01.1990
Fish Market At Pandarpur Catch (Bhima River)	9	K.C.Jayaram & Party	13.05.1988
Bangladesh (Brahmaputra)	11	C.T.Sai & Y.Haroon	05.01.1978

Table – 1 (b): Sample Collection - Location Site - *Puntius chola* (Hamilton, 1822)

LOCATIONS	NO. OF FISHES	COLLECTOR	DATE
Kancheepuram (Palar River)	6	Dr.M.B.Raghunathan	07.04.2002
Pudukkottai (Kaveri River)	8	Dr. G.Thirumalai & Party	06.05.1986
Nagula Vellatur (Krishna River)	7	T.Venkateswarlu	21.03.1983
Somasila (Pennar River)	6	T.Venkateswarlu	17.03.1983
Karad Fish Market (Bhima River)	8	K.C.Jayaram & Party	10.03.1990

***Puntius sophore* (Hamilton- Buchanan, 1822)**

Phylum : Chordata  
 Class : Pisces  
 Order : Cypriniformes  
 Family : Cyprinidae  
 Genus : *Puntius*  
 Species : *sophore*

***Puntius chola* (Hamilton - Buchanan) 1822**

Phylum : Chordata  
 Class : Pisces  
 Order : Cypriniformes  
 Family : Cyprinidae  
 Genus : *Puntius*  
 Species : *chola*

**Meristic Characters**

Two species were obtained from the Zoological Survey of India (ZSI), Southern Regional Centre, Chennai. *Puntius sophore* (114 specimens) were collected from seven Indian river systems and 35 specimens of *Puntius chola* were collected from five South Indian River systems. Meristic counts (11 characters) for *P.sophore* and *P.chola* were carried out.

**Results And Discussion**

Analysis of frequency distribution of the 11 meristic characters of both species *Puntius sophore* and *Puntius chola* showed that there was no variation between the populations from the various river systems.

***Puntius sophore* (Hamilton - Buchanan, 1822)**

D. iii 8; A. ii 5; P. i 14; V. i 8; C. 19; L. 1 24-26; L. tr. 3½ - 1 - 3 - 3½; predorsal scales 9-10; preventral scales 9-10; circumferential scales 15-16; circumpeduncular scales 9-10 (Table 2).

***Puntius chola* (Hamilton - Buchanan, 1822)**

D. iii 8; A. ii 5; P. i 13-14; V. i 8; C. 19; L. l. 26 - 27; L. tr. 3½ - 1 - 3 - 3½; predorsal scales 10; preventral scales 9-10; circumferential scales 15-16; circumpeduncular scales 9 - 10 (Table 3). The data for meristic and coded characters obtained for the *Puntius sophore* and *Puntius chola* examined in the present study were more or less comparable with the majority of earlier studies by Jayaram (1991), Pethiyagoda (1991), Deraniyagala (1952), and Munro (1955).

De Silva and Liyanage (2010) have suggested that meristic counts are discrete in nature, they were efficient for developing a dichotomous key for *Puntius* species in Sri Lanka as they gave sharp demarcations between individual species. Some meristic characters overlapped among species however and were therefore of limited use for distinguishing the species. Ihssen, *et al.* (1981), also have suggested that the discrete nature of meristic data reduces its suitability for the application of more powerful statistical analysis. Das *et al.*, (1985) have reported in studies on *Hilsa Ilisha* that meristic characters showed no significant differences in the mean values between stations.

**Summary and Conclusion**

The present study was conducted to analyze the geographic variations among the freshwater fishes of Indian river systems. Two species were obtained from the Zoological Survey of India (ZSI), Southern Regional Centre, Chennai. *Puntius sophore* (114 specimens) were collected from seven Indian river systems and 35 specimens of *Puntius chola* were collected from five South Indian River systems. Meristic counts (11 characters) for *P. sophore* and *P. chola* were carried out. Analysis of frequency distribution of the meristic characters of both species *P. sophore* and *P. chola* showed that there were no significant variations between the populations from the various river systems of India.

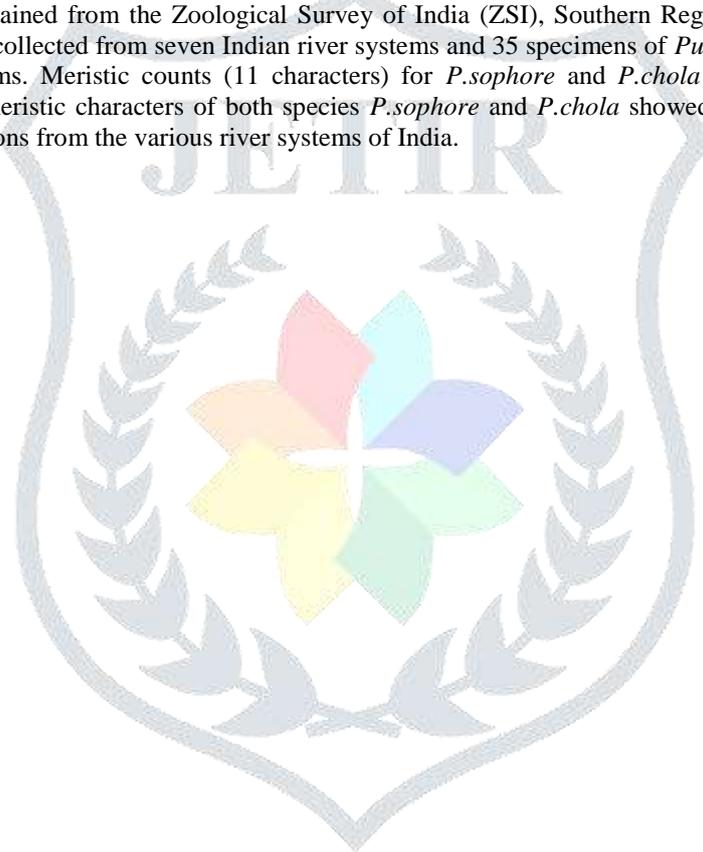




Table – 3: Frequency Distribution of Meristic Characters of *Puntius chola* in various river systems

S. No	Meristic Count		Dorsal Fin Rays		Pectoral Fin Rays		Ventral Fin Rays		Anal Fin Rays		Caudal fin rays		Lateral line scales			Lateral Transverse Scales					Pre-dorsal Scales		Pre-ventral Scales		Circumferential Scales			Circumpeduncular Scales				
	UB	B	UB	B	UB	B	UB	B	UB	B	UB	B	26	27	28	DS	LS	VS	DS	LS	VSS	10	11	9	10	15	16	17	9	10		
1.	3	8	1	13	1	14	1	8	2	5	18	19	26	27	28	3½	1	3	3½	1	3½	10	11	9	10	15	16	17	9	10	-	-
	6	6	5	5	1	6	6	6	6	6	6	6	4	2	-	5	1		1			6		5	1	5	1	-	6	-		
2.	8	8	5	5	3	8	8	8	8	8	6	2	6	1	1	8	-		-			7		7	1	8	-	-	7	1		
3.	7	7	5	5	2	7	7	7	7	7	7	-	7	-	-	5	2		2			7		7	-	5	2	-	7	-		
4.	6	6	6	6	-	6	6	6	6	6	6	6	5	-	1	6	-		-			4		5	1	6	-	-	5	1		
5.	8	8	6	6	2	8	8	8	8	8	8	8	7	1	-	8	-		-			7		5	3	8	-	-	8	2		

The abbreviations used in tables 2 and 3 are enlisted below.

- UB - Unbranched Spine
- B - Branched Rays
- DSS - Dorsal side scale
- LSS - Lateral side scale
- VSS - Ventral side scale

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