

RECORDS OF THE ZOOLOGICAL SURVEY OF INDIA

OCCASIONAL PAPER NO. 135

Revision of the Genus *Puntius* Hamilton
from the Indian Region

(Pisces : Cypriniformes, Cyprinidae, Cyprininae)

K. C. JAYARAM

Zoological Survey of India, Madras 600 028



Edited by the Director
Zoological Survey of India, Calcutta
1991

© Copyright, 1991 Government of India

Published : August 1991

Price
Indian : Rs. 175.00
Foreign : \$ 12.00 £ 8.00

Published by
The Director, Zoological Survey of India, Calcutta

Laser set by Neatpoint Photocomposers, 6A Sudder Street, Calcutta 700 016
and printed by Asian Printers, Calcutta 700 014

RECORDS OF THE ZOOLOGICAL SURVEY OF INDIA
OCCASIONAL PAPER

NO 135

1991

PAGE 1 - 178

CONTENTS

Introduction	1	
Systematic Account	3	
Order	CYPRINIFORMES	
Suborder	CYPRINOIDEI	
Family	CYPRINIDAE	
Subfamily	CYPRININAE	
Genus	<i>Puntius</i> Hamilton	3
Nomenclature of the genus	5	
Classification	6	
KEY TO SPECIES	7	
1. The <i>sophore</i> group		
1. <i>P. sophore</i> (Hamilton)	15	
2. <i>P. terio</i> (Hamilton)	20	
3. <i>P. ticto</i> (Hamilton)	22	
4. <i>P. conchoni</i> (Hamilton)	27	
5. <i>P. shalynius</i> Yazdani & Talukdar	30	
2. The <i>guganio</i> group		
6. <i>P. guganio</i> (Hamilton)	32	
7. <i>P. punjabensis</i> (Day)	35	
8. <i>P. nangalensis</i> Jayaram	37	
9. <i>P. apogon</i> (Valenciennes)	39	
3. The <i>fraseri</i> group		
10. <i>P. fraseri</i> Hora & Misra	41	
11. <i>P. deccanensis</i> Yazdani & Babu Rao	44	
4. The <i>jerdoni</i> group		
12. <i>P. jerdoni</i> (Day)	46	
5. The <i>chola</i> group		
The <i>chola</i> complex		
13. <i>P. chola</i> (Hamilton)	52	

14.	<i>P. parrah</i> (Day)	56
15.	<i>P. burmanicus</i> (Day)	59
	The <i>amphibius</i> complex	
16.	<i>P. amphibius</i> (Valenciennes)	61
17.	<i>P. dorsalis</i> (Jerdon)	64
18.	<i>P. cauveriensis</i> Hora	68
	The <i>bimaculatus</i> complex	
19.	<i>P. bimaculatus</i> (Bleeker)	70
20.	<i>P. denisonii</i> (Day)	71
21.	<i>P. melanostigma</i> (Day)	73
22.	<i>P. arenatus</i> (Day)	75
6.	The <i>filamentosus</i> group	
	The <i>filamentosus</i> complex	
23.	<i>P. filamentosus</i> (Valenciennes)	77
24.	<i>P. waageni</i> (Day)	84
	The <i>virrarus</i> complex	
25.	<i>P. vittatus</i> Day	86
26.	<i>P. muzafarpurensis</i> Srivastava	88
27.	<i>P. coorgensis</i> Jayaram	90
	The <i>thomassi</i> complex	
28.	<i>P. thomassi</i> (Day)	92
29.	<i>P. lithopidos</i> (Day)	94
7.	The <i>micropogon</i> group	
	The <i>micropogon</i> complex	
30.	1. <i>P. micropogon micropogon</i> (Valenciennes)	96
	2. <i>P. micropogon periyarensis</i> Raj	99
31.	<i>P. dubius</i> (Day)	101
32.	<i>P. ophicephalus</i> (Day)	103
33.	<i>P. kolus</i> (Sykes)	105
	The <i>carnaticus</i> complex	
34.	<i>P. carnaticus</i> (Jerdon)	108
35.	<i>P. bovanicus</i> (Day)	110
8.	The <i>sarana</i> group	
	The <i>sarana</i> complex	
36.	1. <i>P. sarana sarana</i> (Hamilton)	113
	2. <i>P. sarana spilurus</i> (Gunther)	119

3.	<i>P. sarana subnasutus</i> (Valenciennes)	120
4.	<i>P. sarana orphoides</i> (Valenciennes)	123
37.	<i>P. jayarami</i> Vishwanath Singh & T. Singh	
	The <i>binotatus</i> complex	
38.	<i>P. binotatus</i> (Valenciennes)	126
39.	<i>P. roseipinnis</i> (Valenciennes)	128
40.	<i>P. pleurotaenia</i> (Bleeker)	130
41.	<i>P. compressiformis</i> (Cockerall)	132
9.	The <i>fasciatus</i> group	
	The <i>fasciatus</i> complex	
42.	1. <i>P. fasciatus fasciatus</i> (Jerdon)	135
	2. <i>P. fasciatus pradhani</i> Tilak	139
43.	3. <i>P. afasciatus</i> Jayaram	141
	The <i>arulius</i> complex	
44.	1. <i>P. arulius arulius</i> (Jerdon)	144
	2. <i>P. arulius tambraparnei</i> Silas	146
	3. <i>P. arulius scrilankensis</i> (senanayake)	148
	The <i>cumingii</i> complex	
45.	<i>P. cumingii</i> (Gunther)	150
46.	<i>P. nigrofasciatus</i> (Gunther)	152
47.	<i>P. singhala</i> (Duncker)	155
48.	<i>P. titteya</i> Deraniyagala	157
	The <i>narayani</i> complex	
49.	<i>P. narayani</i> (Hora)	159
50.	<i>P. sahayadriensis</i> Silas	161
10.	The <i>puntio</i> group	
51.	<i>P. puntio</i> (Hamilton)	164
52.	<i>P. phutunio</i> (Hamilton)	166
53.	<i>P. gelius</i> (Hamilton)	168
	Species of “<i>Barbus</i>” outside Indian Region but referred to in Indian Literature.	171
	Systematic position of species of <i>Barbus</i> / <i>Puntius</i> not dealt in this monograph	172
	References	175

ACKNOWLEDGEMENTS

I am thankful to Drs. T. N. Ananthkrishnan, K. K. Tiwari, B. K. Tikader and Prof. Mohammad Shamim Jairajpuri successive Directors of the Zoological Survey of India for continued support and encouragement. The Department of Environment, Government of India, New Delhi awarded me an Emeritus Fellowship for two years which helped to meet partly the expenses in preparing this monograph. I am grateful for this award.

Dr. R. S. Pillai, Officer-in-Charge, Southern Regional Station, Zoological Survey of India, Madras gave me laboratory facilities and I am thankful to him for the same. Sarva Shri Parimal Biswas, Dhananjoy Pyne, Biswanath Mandal and Dibyendu Sengupta artists of Zoological Survey of India made the illustrations. Shri Ashok Kumar Choudhury, B. Hanumantha Rao Kumari Bhuma and Shri C. Rajendran typed the many drafts and final copies. To them my thanks are due.

Dr. Gordon Howes, British Museum (Natural History), London, Mme. Dr. M. L. Bauchot, Paris lent material for which I am indebted. Prof. M. R. Mirza, Lahore, Dr. Walter Rainboth, Los Angeles gave many suggestions for which my thanks are due.

INTRODUCTION

Cyprinoidei are a suborder of the fresh water fishes of the order Cypriniformes, under superorder Ostariophysii of which 250 genera and 2500 species are known to exist all over its range. Of the families known of this suborder, Cyprinidae is by far the most abundant and dominant in respect of species proliferation and also in successfully occupying niches over-running other groups. The suborder is found in Eurasia (as far east as the Wallace's Line) North America (as far South as Guatemala) and in Africa where they are plenty. They are absent from South America, Australia and Madagascar:

Cyprinidae is divided into five subfamilies : Schizothoracinae, Cultrinae, Hypophthalmichthyinae, Rasborinae and Cyprininae. The last mentioned subfamily with 24 genera is the economically important group comprising the major carps, Mahseers and other fishes of cultivable nature. This paper deals with the genus *Puntius* Hamilton only.

METHODS

Measurements and counts have been taken as per standards already described in my Handbook on the Freshwater Fishes of India (Jayaram, 1981). Values are expressed in percentage of standard length, head length etc. While scale counts have been comparatively easy in species of this genus occasionally where the specimens are old, damaged, certain counts could not be taken with certainty. The published figure and data in literature have been utilised in such instances. However, in comparison tables ratios alone have been given since Day (1878, 1889) and many other old and recent workers have used only this value. This facilitates easy determination of variations.

ARRANGEMENT

All the 53 species have been classified into 10 groups and 14 complexes and the entire assemblage is according to the phylogeny and inter-relationships of the species within this genus. The key however is artificial and does not reflect phylogeny. For each species the complete synonymy is given as possible, local vernacular names followed by the material examined. Where no specimens could be seen the descriptions are after the published literature. Under diagnosis for a quick identification of the species, the chief identifying characters are given. Colours are of preserved material and wherever I have examined fresh material I have given their life colours also. The additional data given at the end should supplement those given in the body of the description.

ABBREVIATIONS AND CONDENSATIONS

MUSEUMS

- ZSI : Zoological Survey of India, Calcutta.
ZSI.SRS : Zoological Survey of India, Southern Regional Station, Madras.
ZSI.HFAS : Zoological Survey of India, High Altitude Field Zoology Station, Solan (Himachal Pradesh).

- ZSI.WRS : Zoological Survey of India, Western Regional Station, Poona.
 ZSI.NRS : Zoological Survey of India, Northern Regional Station, Dehra Dun.
 ZSI.ERS : Zoological Survey of India, Eastern Regional Station, Shillong, Meghalaya.
 BMNH : British Museum (Natural History), London.
 MHNP : Museum Natural History, Paris.

MEASUREMENTS AND COUNTS

- SL : Standard length
 TL : Total length
 LH : Head length
 BD : Body depth
 LCPD : Length of caudal peduncle
 HCPD : Least depth of caudal peduncle
 D : Dorsal fin rays
 P : Pectoral fin rays
 V : Pelvic fin rays
 A : Anal fin rays
 C : Caudal fin rays
 LL : Lateral line scales
 PDS : Pre-dorsal scales
 IND : Inter-nostril distance
 IOW : Inter-orbital width

VERNACULAR NAMES

- Ass. : Assamese
 Beng. : Bengali
 Hin. : Hindi
 Kan. : Kannada
 Mal. : Malayalam
 Mar. : Marathi
 Ori. : Oriya
 Pun. : Punjabi
 Tam. : Tamil
 Tel : Telugu

SYSTEMATIC ACCOUNT

Order	CYPRINIFORMES
Family	CYPRINIDAE
Subfamily	CYPRININAE
Genus	<i>Puntius</i> Hamilton

Barbus (in part) Cuvier, *Regne Anim.*, p.192, 1871 (type species, *Cyprinus barbus* Linn.).- McClelland, *Asiat. Research*, 19, p.269, 332, 1839.- *Barbus* (in part) Valenciennes, *Hist. Nat. Poiss.*, 16, p.269, 1842.- Heckel, *IN : Russegger's Reisen in Europa* Part 1, p.1842.- Bleeker, *Nat. & Geneesk. Arch. Ned. Ind.*, 1, p.552, 1844.- Smith, A., *Illustr. Zool. S. Africa*, pl. 1849.- Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.431, 1859.- Bleeker, *Ned. Tijdschr. Dierk.*, 1, p.198, 1863.- Gunther, *Cat. Fish. Brit. Mus. Nat. Hist.*, 7, p.82, 1868.- Day, *Fish. India*, p.556, 1878.- Day, *Fauna Brit. India. Fish.*, 1, p.293, 1889.- Weber & Beaufort, *Fish. Indo-Austral Archipel.*, 3, p.170, 1916 (as a separate genus).- Annandale, *Rec. Indian Mus.*, 14, p.48, 1918 (Inle Lake, Burma).- Annandale, *Rec. Indian Mus.*, 16, p.134, 1919 (confusion in generic composition indicated).- Chaudhuri, *Rec. Indian Mus.*, 16, p.283, 1919 (name only, species from Burma).- Annandale & Hora, *Rec. geol. Surv. India*, 56, p.209, 1927 (comparison with other similar genera).- Shaw & Shebbeare, *J. Roy. Asiat. Soc. Beng.*, 3(1), p.33, 1937 (*Cyclochelichthys* and *Lissocheilus* included).- Hora, *Rec. Indian Mus.*, 39, p.18, 1937 (*Barbus* considered as belonging to "group *Puntius*").- Hora, *Rec. Indian Mus.*, 44, p.199, 1942 (record of the genus by Blanford in Carnatic tract).- Nichols, *FW. Fish. China, Nat. Hist. Cent. Asia*, 9, p.67, 1943 (Chinese species).- Nazir Ahmad, *Bull. Dept. zool. Punjab Univ.*, 1, p.283, 1943 (species of Lahore).- Hora, *Proc. nat. Inst. Sci. India*, 10(4), p.424, 1944 (distribution, India and Africa).- Bhuiyan, *Fishes of Dacca*, p.32, 1964 (systematic account of Bangladesh species).- Dutt & Murthy, *Mem. zool. Soc. Guntur*, 1, p.74, 1976 (key characters discussed).- Murty, *Proc. Indian Acad. Sci.*, 85(B) (3), p.120, 1977 (four species from Lake Kolleru described).- Hora & Mukerji, *Health Bull.*, (2), pp.28, 34-36, 39, 41, 1938 (larvicidal species discussed).- Hora & Misra, *J. Roy. Asiat. Soc. Beng.*, 9, p.4, 1943 (species from R. Tigris considered not different from Indian *Puntius*).- Smith, *Bull. U.S. Nat. Mus.*, (188), p.145, 1945 (nomenclature, Thailand species).

Puntius (in part) Hamilton, *Fish. Ganges*, pp.310, 388, 1822 (type species, *Cyprinus sophore* Hamilton).- Bleeker, *Ned. Tijdschr. Dierk.*, 1, p.199, 1863.- Bleeker, *Versl. Akad. Amsterdam*, 15, p.263, 1863.- Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*).- Day, *Fish. India*, p.556, 1878 (as a synonym of *Barbus*).- Day, *Fauna Brit. India. Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*).- Weber & Beaufort, *Fish. Indo-Austral. Archipel.*, 3, p.170, 1916 (definition, description of Indo-Australian species).- Annandale, *Rec. Indian Mus.*, 14, p.48, 1919 (Inle Lake).- Deraniyagala, *Spolia Zeylanica*, 16(1), p.9, 1930 (definition, Sri Lanka species described).- Nichols, *FW. Fish. China, Nat. Hist. Cent. Asia*, 9, p.74, 1943 (as a subgenus).- Smith, *Bull. U.S. Nat. Mus.*, (188), p.165, 1945 (nomenclature discussed, type species erroneously cited as *P. puntius* Hamilton).- Misra, *Rec. Indian Mus.*, 57, p.151, 1962.- Islam & Siddiqui, *Biologia*, 17(1), p.33, 1971.- Menon, *Int. Fish. Soc. India, Spl. Publ.*, 1, p.37, 1974 (checklist).- Srivastava, *Fishes of UP & Bihar*, p.59, 1980.- Jayaram, *Handbk. FW. Fish. India*, p.97, 1981 (list of species, key).- Jayaram *et al.*, *Occ. Pap. zool. Surv. India*, No.36, p.48, 1982 (Cauvery species).- Sen, *Occ. Pap. zool. Surv. India*, NO.64, p.77, 1985 (Assam species).

Cyprinus (in part) Hamilton, *Fish. Ganges*, p.256, 383, 1822.- Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*).- Day, *Fish. India*, p.556, 1878 (as a synonym of *Barbus*).

Labeobarbus (in part) Ruppell, *Mus. Sencenb.*, 2, p.14, 1837 (type species, *Labeobarbus medgia* Ruppell).- Valenciennes, *Hist. Nat. Poiss.*, 16, p. 1842.- Heckel *IN : Russegger's Reisen in Europa*, Part 1, p. 1842.- Bleeker, *Nat. & Geneesk. Arch. Ned. Ind.*, 1, p.552, 1844.- Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.431, 1859.- Bleeker, *Ned. Tijdschr. Dierk.*, 1, p.198, 1863.- Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*).- Day, *Fish. India*, p.556, 1878 (as a synonym of *Barbus*).- Day, *Fauna Brit. India. Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*).- Weber & Beaufort, *Fish. Indo-Austral. Archipel.*, 3, p.147, 1916 (as a separate genus).- Hora, *J. Bombay nat. Hist. Soc.*, 41(2), p.276, 1939 (relationship with *Tor* indicated).- Hora, *J. Bombay nat. Hist. Soc.*, 41(3), 1940 (*Labeobarbus* considered indistinct from *Tor*).

Capoeta (in part) Valenciennes, *Hist. Nat. Poiss.*, 16, p.278, 1842 (type species, *Cyprinus capoeta* Guldenstadt).- Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.431, 1859.- Bleeker, *Ned. Tijdschr. Dierk.*, 1, p.200, 1863.- Gunther,

- Cat. Fish. Brit. Mus.*, 7, p.82, 1868, (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*). - Hora, *J. Bombay nat. Hist. Soc.*, 36(3), p. 693, 1933 (occurrence in Noshki, Afghanistan).
- Luciobarbus* Heckel IN : Russegger's, *Reisen in Europa*, Part 1, p. 1842 (type species, *L. esocinus* Heckel). - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*).
- Cheilobarbus* Smith, A., *Illustr. Zool. S. Africa*, pl.10, 1849 (type species, *Barbus capensis* Smith). - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*).
- Anematischys* Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.431, 1859 (type species, *Barbus apogon* Bleeker). - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293 (as a synonym of *Barbus*).
- Hypselobarbus* (in part) Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.431, 1859 (type species, *H. typus* Bleeker). - *Ned. Tijdschr. Dierk.*, 1, p.199, 1863. - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293 (as a synonym of *Barbus*).
- Gonoproktopterus* Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.430, 1859 (type species, *Barbus kolus* Sykes). - Bleeker, *Ned. Tijdschr. Dierk.* 1, p.199, 1863. - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293 (as a synonym of *Barbus*).
- Balantiocheilos* Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.430, 1859 (type species, *B. melanopterus* Bleeker). - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878 (as a synonym of *Barbus*). - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*). - Weber & Beaufort, *Fish. Indo-Austral. Archipel* 3, p.205, 1916 (as a separate genus).
- Hemibarbus* Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.431, 1859 (type species, *Gobio barbus* Temminck & Schlegel). - Bleeker, *Ned. Tijdschr. Dierk.*, 1, p.198, 1863. - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1878 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*).
- Cyclocheilichthys* (in part) Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.431, 1859 (type species *C. armatus* Bleeker). - Bleeker, *Ned. Tijdschr. Dierk.*, 1, p.199, 1863. - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878 (as a synonym of *Barbus*). - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889. - Weber & Beaufort, *Fish. Indo-Austral. Archipel.*, 3, p.153, 1916 (as a separate genus). - Nichols, *FW. Fish. China Nat. Hist. Cent. Asia*, 9, p.78, 1943 (as a subgenus of *Barbus*).
- Siaja* (in part) Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.431, 1859 (type species, *Capoeta siaja* Bleeker). - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*). - Smith, *Bull. U.S. nat. Mus.*, (188), p.140, 1945.
- Varicorhinus* (in part) Ruppell, *Mus. Senckenb.* 2, p.14, 1837 (type species, *Labeo varicorhinus* Val.) - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*).
- Systemus* (in part) McClelland, *Asiat. Research.*, 19, p.284, 1839 (type species, *S. immaculatus* McClelland). - Heckel, IN : Russegger's *Reisen in Europa*, Part 1, p. 1842. - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*). - Hora, Misra & Malik, *Rec. Indian Mus.*, 41, p.265 1939 (difficulty of precise specific limits indicated).
- Pseudobarbus* Smith, A., *Illustr. Zool. S. Africa*, pl.116, 1849 (type species, *Barbus burchelli* Smith). - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*).
- Barbodes* Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.431, 1859 (type species, *Systemus belinka* McClelland). - Bleeker, *Ned. Tijdschr. Dierk.*, 1, p.200, 1863. - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*). - Hora, *J. Bombay nat. Hist. Soc.*, 41(2), p.276, 1939 (name only, similarity to *Tor* suggested).

Gnathopogon Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.431, 1859 (type species, *Capoeta elongata* Temminck & Schlegel). - Bleeker, *Ned. Tijdschr. Dierk.*, 1, p.202, 1863. - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*).

Hampala Van Hasselt, *Allgemeine Konst. en. Letterbok*, 2, p.132, 1823 (type species, *Hampala macrolepidota* Van Hasselt). - Bleeker, *Nat. Geneesk. Arch. Ned. Ind.*, 1, p.552, 1844. - Bleeker, *Nat. Tijdschr. Ned. Ind.*, 20, p.430, 1859. - Bleeker, *Ned. Tijdschr. Dierk.*, 1, p.200, 1863. - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878 (as a synonym of *Barbus*). - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889. - Weber & Beaufort, *Fish. Indo-Austral. Archipel.*, 3, p.143, 1916 (as a separate genus). - Smith, *Bull. U.S. nat. Mus.*, (188) p.132, 1945.

Enteromius Cope, *Trans. Amer. Philos. Soc.*, 13, p.405, 1867 (type species, *E. potamogalis* Cope). - Gunther, *Cat. Fish. Brit. Mus.*, 7, p.82, 1868 (as a synonym of *Barbus*). - Day, *Fish. India*, p.556, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.293, 1889 (as a synonym of *Barbus*).

Body short, moderately elongate to deep, compressed. Abdomen rounded. Head short. Snout obtuse. Conical or pointed, may or may not be overhanging the jaw, occasionally with tubercles or pores. Mouth arched, anterior or inferior without inner folds, upper jaw more or less protractile. Eyes moderate to large, without adipose lids, dorso-lateral. Lips thin, covering the jaws, may have leathery lobes but without any horny covering (exception *P. lithopidos*). Jaws simple, covered by lips without any knob or tubercles at the symphysis. Pharyngeal teeth 2,3,5 – 5,3,2. Barbels four, two or more, maxillary/rostral, no nasal. Dorsal fin short may be with a scaly sheath at a base inserted nearly opposite pelvic fins, with 9 or 13 rays (usually seven and not more than nine branched) with its last simple ray either ossified, and serrated or entire, or articulated and not osseous. Anal fin very short, high with seven to nine (mostly five or rarely six branched) rays. Caudal fin forked. Scales small, moderate or large, with four strongly divergent striae. Anal scales not enlarged. Lateral line complete or incomplete with 20-47 scales.

Air bladder bipartite, free.

Type species *Cyprinus sophore* Hamilton.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Sri Lanka, Burma, Thailand and Malaya Archipelago. Also found in southern continental China.

NOMENCLATURE OF THE GENUS

There has been considerable inconsistency and confusion in adopting the name *Barbus* Cuvier, 1817 and/or *Puntius* Hamilton, 1822. Hamilton placed some species under his division *Puntius* and a few others under the division *Cyprinus*. Several workers have treated these names either as a separate genus or a subgenus (see synonymy). The confusion is mainly due to the lack of a revision* of the entire "*Barbus*" group of species on a world wide basis to know its generic limits and composition.

Barbus (sensu lato) comprises of about 600 species in its entire range which extends from Africa, Asia and Europe, to Central China, the Philippines and the East Indies. Gunther (1868) subdivided the genus into several sections on geographical grounds. Day (1878,

* Dr. Walter Rainboth, Los Angeles Country Museum, Los Angeles, California has attempted such a work but the results are not yet published.

1889) used the name *Barbus* in a wide sense, although in his key he utilised the Bleekerian names without any definite indication of their status. Weber & Beaufort (1916) dealt with the species of East Indies, and they divided *Barbus* into smaller genera and they recognised *Puntius* as a valid one. Smith (1945) adopted the name *Puntius* for the species from Thailand, although he remarked that they fall under "a large group whose exact relations and nomenclature await elucidation" Hora (1937), Hora *et al.* (1939), Hora and Law (1941), Hora and Nair (1941) treated *Puntius* as a subgenus of *Barbus*. De Witt (1960) kept the species under *Barbus*. Myers (1960) suggested that the name *Barbus* be retained in its broad sense. Misra (1962) used *Puntius* for all species described in his work.

In determining the exact generic name to be adopted a look into the problem of the designation of the type species considerably helps towards a solution.

The genus *Puntius* was proposed by Hamilton without any definite type designation. Several workers believed that *Puntius puntio* Hamilton, a species included by Hamilton, would be the type by the rule of absolute tautonymy. *Puntius* and *puntio* are spelled differently and hence the tautonymy cannot be considered. Bleeker (1863) in his *Atlas Ichthyologique* unequivocally designated *P. sophore* Hamilton as the type and this invariably is chosen and considered as the valid type species of *Puntius*. *P. sophore* is widely distributed in Indian waters.

On the other hand the genus *Barbus* was proposed by Cuvier in 1817 to accommodate species as *Cyprinus barbuis* Linnaeus which is found in Europe and not in Asia.

In view of the above reasons, and also thanks to researches of Rainboth, it is now widely accepted that the name *Barbus* be used to represent the barbels of European continent and *Puntius* for the Asiatic, especially Indian fishes.

CLASSIFICATION

Fishes of the genus *Puntius* are much generalised and exhibit variations both within the individuals of the same species and also within the same sex. The taxonomic characters commonly used are not helpful in clear cut diagnosis of the species. However many species are beautifully coloured, some with dark blotches on the body, some with longitudinal and a few with vertical bands. Unfortunately in old museum specimens these tend to fade or even obliterate with the result that identification becomes difficult. However it is seen the squamation of the species, combined with colour characteristics may be of some assistance and this course is adopted in this work. The osseous or non osseous nature of the dorsal spine is also of some utility. The number of barbels is especially diagnostic and I have not found much variation in this.

The entire gamut of about 70 species of *Puntius* so far known have been brought down to 53. Two species have been described as new.

When the species are classified as per their affinities as exhibited by their morphometry, they group themselves into several assemblages reflecting their phylogeny. I have as such divided the 53 species into 10 groups with 14 complexes and have made comparisons of the groups and their complexes. In my opinion *sophore* and *sarana* are of two independent origin and by themselves have given rise to several groups.

Taki *et al.* (1978) after investigating infraorbital bones, pharyngeal teeth count, lateral folds, barbels, and colour pattern in 23 species of *Puntius* from South east Asia came to a similar conclusion. They divided the 23 species into six phyletic groups. They also found that species of the one group overlapping other in geographical range. They did not support Bleeker's (1863) division of *Puntius* into subgenera *Puntius*, *Barbodes* and *Capoeta*.

Magtoon & Arai (1989) have recently demonstrated after studying the karyotypes of five *Puntius* species, that the genus *sensu stricto* comprises two types of karyotypes, and it is not a monophyletic group. This is in line with my inference also.

Artificial Key to the species and subspecies of *Puntius*

1. Barbels Present2
Barbels absent 39
2. Two pairs of barbels 3
Only one pair of barbels 23
3. Lateral line scales less than 35 4
Lateral line scales 35 and above 18
4. Last unbranched dorsal ray osseous, strong 5
Last unbranched dorsal ray non-osseous weak articulated 14
5. A dark band from eye to tip of caudal fin along lateral line present. Above this another yellowish brown streak; both as wide as orbit (Sri Lanka) ...
.....*P. pleurotaenia*
No such longitudinal, colour stripes present 6
6. A finger like mark on caudal peduncle present 7
No such finger like mark on caudal peduncle present 10
7. Lateral line scales 26 to 28 (Sri Lanka)*P. sarana spilurus*
Lateral line scales more than 28 8
8. Lateral line scales 31 or 32 (Krishna River System and above)
.....*P. sarana sarana*
Lateral line scales 28 to 34 9
9. Pre-dorsal scales 8 to 10 (South of Krishna River System).....
.....*P. sarana subnasutus*
Pre-dorsal scales 10 to 13 (Manipur, Burma, Thailand, Malaya, Java, Borneo)
.....*P. sarana orphoides*
10. Pre-anal scales 20 to 22 *P. carnaticus*

- Pre-anal scales 11 to 18 11
11. Lateral line scales 28 to 32 (Manipur) *P. jayarami*
Lateral line scales 22 to 27 12
12. Pre-anal scales 11 to 14, Pre-pelvic scales 5 to 7. Body with black spots. Snout conical with a groove, often with tubercles. *P. binotatus*
Pre-anal scales 16 to 18, pre-pelvic scales 8 or 9. Body plain, snout normal 13
13. Lateral line scales 22. Head width 1.93 to 2.33, snout 3.85 to 4.31 in head length. Dorsal spine short, serrated. Pelvic, anal and caudal fins red, lower lobe tinged black. *P. roseipinnis*
Lateral line scales 24 to 26. Head width 1.29 to 1.91, snout 2.57 to 3.18 in head length. Dorsal spine smooth, as long as body depth or slightly shorter, fins plain. *P. bovanicus*
14. Body with vertical colour bands 15
Body without any colour bands 16
15. Body with 3 vertical black bands. IOW/eye 1.0 to 1.28, circumpeduncular scales 8 to 10. *P. fasciatus fasciatus*
Body with 4 vertical black bands. IOW/eye 1.0 to 1.28, circumpeduncular scales 11 or 12. *P. fasciatus pradhani*
16. Lateral line scales 22. Pre-dorsal scales 6. *P. afasciatus*
Lateral line scales 27 to 34. 17
17. Lateral line scales 27 to 32. Circumpeduncular scales 9 to 11. Scales not coloured. *P. jerdoni*
Lateral line scales 31 to 34. Circumpeduncular scales 10. Each scale with a red lunule and with a dark base. *P. thomassi*
18. Mouth slightly upturned, body herring like. Gape of mouth .. extending to below anterior border of eyes. (Burma) *P. compressiformis*
Mouth subterminal, body not herring like. Gape of mouth not extending to below anterior border of eyes. 19
19. Either jaw with a thin cartilaginous covering. Outer rays of caudal fin characteristically white. No dark lateral band on body. *P. lithopidos*
Jaws without such cartilaginous covering. No such colouration of caudal fin. 20
20. Scales between lateral line and dorsal fin 8 or 9; between lateral line and anal fin 5 to $6\frac{1}{2}$ *P. dubius*

- Scales between lateral line and dorsal fin $5\frac{1}{2}$ to $7\frac{1}{2}$ and anal fin $3\frac{1}{2}$ to $4\frac{1}{2}$21
21. Dorsal spine stiff, but weak, articulated in upper part. Body eel like.
.....*P. ophicephalus*
- Dorsal spine osseous, strong, Body not eel-like.22
22. Pre dorsal scales 12 to 14, pre-anal scales 21 to 23, lateral line scales 38 to 41.*P. micropogon micropogon*
- Pre dorsal scales 19 to 21 pre-anal 28, lateral line scales 42 or 43.
.....*P. micropogon periyarensis*
23. Lateral line scales 35 and above 14
- Lateral line scales less than 35 26
24. Lateral line incomplete with 42 to 45 scales ceasing after 8 to 10 scales. A silvery streak along middle of body which becomes wider posteriorly. Caudal fin base with a round black spot and also smaller one at base of dorsal fin.
.....*P. fraseri*
- Lateral line complete 25
25. Dorsal spine osseous, robust, serrated. A ridge like swelling present longitudinally along posterior half of lateral line. Eyes 3.40 in head length, 1.6 in interorbital width and 2.83 in snout length.
.....*P. deccanensis*
- Dorsal spine weakly osseous, articulated. No such ridge present. Eyes 4.25 to 5.56 in head length, 1.75 to 1.92 in interorbital width and 1.79 to 2.5 in snout length.*P. kolus*
26. Lateral line incomplete. Body with a dark lateral band running from upper lip through mid eye to end of median caudal rays; above this an yellow line, below it 10 black blotches above anal fin. (Sri Lanka)
.....*P. titeya*
- Lateral line complete. Colouration not as above. 27
27. Last unbranched dorsal ray strongly osseous 28
- Last unbranched dorsal ray not osseous, if so very feeble 32
28. A fleshy fold of skin on cheek and a tile of rows of scales at dorsal fin base.
.....*P. cauveriensis*
- No such a fold of skin or tile of rows of scales 29
29. Body with two conspicuous dark blotches generally between 21st and 23rd scales and another near the gill opening. A dark mark at base of anterior dorsal ray also present.*P. chola*

- Body with a single blotch at caudal base30
30. Dorsal fin inserted midway between tip of snout and caudal fin base. Circumpeduncular scales 10 or 11. Body with a dark bluish longitudinal line. LL/Pelvic scales $2\frac{1}{2}$ to $3\frac{1}{2}$*P. parrah*
- Dorsal fin inserted either nearer to caudal fin base or to tip of snout. LL/Pelvic scales $2\frac{1}{2}$31
31. Dorsal fin inserted nearer caudal fin base than tip of snout. Circumpeduncular scales 9 or 10.*P. dorsalis*
- Dorsal fin inserted nearer tip of snout than caudal fin base. Circumpeduncular scales 10 or 11.*P. burmanicus*
32. A finger like oval dark blotch on caudal fin base , on 12th to 16th scale. Anterior four or five branched dorsal fin rays may be dark tipped and elongated.*P. filamentosus*
- No such finger like mark on caudal fin base, or on dorsal fin rays.33
33. Body with three or four vertically coloured bands.34
- Body without any such vertically coloured bands.35
34. Body with only three vertical bands. No additional band over gill openings. Pectoral fins extend to pelvics. LL/Pelvic $2\frac{1}{2}$ scales. (W.ghats, Nilgiris, Wynaad)*P. arulius arulius*
- Body with three vertical bands. LL/Pelvic $1\frac{1}{2}$ scales. Bands over body three somewhat oblong. (Sri Lanka).*P. arulius srilankensis*
- Body with an additional fourth band over gill openings. Pectoral fin do not extend to pelvics. LL/Pelvic $2\frac{1}{2}$ scales.(Tambraparani river, T. Nadu).
P. arulius tambraparanei
35. Scale between lateral line and dorsal fin $3\frac{1}{2}$ to 4. Dorsal fin with a black spot on the base of 3rd to 8th rays.A black blotch on 23rd and 24th scales.(Sri Lanka).*P. bimaculatus*
- Scales between lateral line and dorsal fin $4\frac{1}{2}$ to 536
36. Lateral line with 23 to 26 scales. Body depth 3.78,head length 4.52 in standard length. Body with a black band along lateral line, above which another scarlet stripe is present. Caudal fin with an oblique band. (Travancore hill ranges)*P. denisonii*
- Lateral line scales 24 to 27. Body depth 3.00 to 3.67, head length 3.24 to 3.75 in standard length.37
37. Predorsal scales 8 to 10. No dark blotches on body. Occasionally a dark band along dorsal fin may be seen.*P. arenatus*

	Pre-dorsal scales 7 to 9	38
38.	Circumpeduncular scales 10 or 11. Head width 1.71 to 3.0 in head length. <i>P. amphibius</i>	
	Circumpeduncular scales 9 or 10. Head width 1.75 to 2.09 in head length. <i>P melanostigma</i>	
39.	Lateral line scales 30 and above	40
	Lateral line scales less than 30.....	43
40.	Lateral line with 43 scales. Dorsal spine weak, non osseous,articulated.. <i>P. punjabensis</i>	
	Lateral line with 30 to 39 scales. Dorsal spine osseous.....	41
41	Lateral line complete. Dorsal spine serrated, longer than head length. Body depth 2.44 to 2.61 in standard length, height of head at occiput 1.55 to 1.66 in head length. (Burma)	<i>P. apogon</i>
	Lateral line incomplete.	42
42	Pre dorsal scales 15, Lateral line/dorsal scales 8 or 9 , pre-anal scales 21. <i>P guganio</i>	
	Pre dorsal scales 12. LL/dorsal scales 5 ¹ / ₂ pre-anal scales 12 to 14. <i>P nangalensis</i>	
43	Dorsal spine weak, non-osseous, articulated.	44
	Dorsal spine strong , osseous, serrated.	50
44	Body with three to seven vertical colour bands. Snout and lips may be with tubercles.	45
	Body without such vertical colour bands. No tubercles on snout and lips.	47
45.	Circumpeduncular scales 10 to 12. Body with three vertical dark bands. LL/pelvic scales 2 ¹ / ₂ to 4. (Karnataka)	<i>P narayani</i>
	Circumpeduncular scales 9 or 10. Body with three to seven vertical dark bands.	46
46.	Body with three vertical dark bands. LL/pelvic 2 ¹ / ₂ scales (Sri Lanka) <i>P singhala</i>	
	Body with seven vertical dark bands./Pelvic 4 ¹ / ₂ scales (Maharashtra) <i>P sahayadriensis</i>	
47.	LL/Pelvic scales 2 ¹ / ₂ to 3	48
	LL/Pelvic scales 4 ¹ / ₂ to 5	49

48. Pre dorsal scales 6 or 7. Fins colourless. Lateral line with 22 to 25 scales.
.....*P. coorgensis*
- Pre dorsal scales 8 to 10. Dorsal fin with a vertical black streak and a black tip with orange markings. Lateral line with 20 to 22 scales.*P. vittatus*
49. A conspicuous hump from occiputi dorsal fin base present; Body depth 2.48 to 2.60 in standard length. (Gangetic system, plains of north India)
.....*P. muzzafarpurensis*
- No such hump present. Body depth 2.67 to 3.00 in standard length. (Shimla, and hill ranges in Pakistan).....*P. waageni*
50. Body with vertical colour bands 51
- Body without vertical colour bands but with one or two black blotches ..
..... 55
51. Lateral line incomplete 52
- Lateral line complete 54
52. Dorsal spine long, longer than head length and body depth. Lateral line with 23 or 24 scales.*P. gelius*
- Dorsal spine short, shorter than or equal to head length and body depth. Lateral line with 19 to 23 scales. 53
53. Lateral line with 20 to 23 scales. Circumpeduncular scales 9 or 10. Body with four vertical dark bands.*P. phutunio*
- Lateral line with 19 to 21 scales. Circumpeduncular scales 8 to 10. Body with two vertical dark bands (Sri Lanka)*P. cumingii*
54. Lateral line scales 23. LL/dorsal fin scales 5, LL/Pelvic $2\frac{1}{2}$. A single wide band around caudal fin base.*P. puntio*
- Lateral line scales 20 or 21. LL/dorsal fin scales $4\frac{1}{2}$, LL/Pelvic $3\frac{1}{2}$. Body with three vertical dark bands (Sri Lanka)*P. nigrofasciatus*
55. Two black blotches on body including dorsal fin. 56
- Only one black blotch on body 58
56. Two dark blotches on tail itself, one above anal fin and another at base of caudal fin. A blue horizontal line along mid body present. LL/dorsal scales $3\frac{1}{2}$ to $4\frac{1}{2}$, LL/Pelvic $2\frac{1}{2}$ to $3\frac{1}{2}$ (Khasi Hills, Meghalaya).
.....*P. shalynius*.
- Two dark blotches situated far apart, one anterior and another posteriorly. LL/dorsal $4\frac{1}{2}$ to $5\frac{1}{2}$. LL/pelvic 3 to $4\frac{1}{2}$ scales. 57

57. Posterior dark blotch on 22nd to 24th scales. Dorsal spine smooth. Gill rakers on lower limb of first gill arch 15 to 17. Pre-anal scales 14 or 15, circumpeduncular scales 9 or 10.*P. sophore*
- Posterior dark blotch on 16th to 20th scales. Dorsal spine serrated. Gill rakers on lower limb of first gill arch 5 to 7. Pre-anal scales 11 to 14, circumpeduncular scales 10 to 12.*P. ticto*
58. Black blotch on 16th to 18th scales: Dorsal spine smooth. Lateral line scales 23 or 24, circumpeduncular scales 6 or 7.*P. terio*
- Black blotch on 18th or 19th scale. Dorsal spine serrated. Lateral line scales 24 to 26, circumpeduncular scales 10 or 11.*P. conchoni*

The "*sophore*" group

Species

- P. sophore* (Hamilton). 1822, p.310
- P. terio* (Hamilton). 1822, p.313
- P. ticto* (Hamilton). 1822, p.314
- P. conchoni* (Hamilton), 1822, p.317
- P. shalynius* Yazdani & Talukdar, 1975, p.218

Common characters

1. Deep bodied fishes without any vertical colour bands on body
Body depth 2.00 to 3.5 times in standard length.
2. No barbels.
3. Dorsal spine ossified.
4. Lateral line scales 21 to 26.
5. PDS. 8-11.
6. LL/Dorsal $3\frac{1}{2} - 5\frac{1}{2}$
7. LL/Pelvic $3 - 4\frac{1}{2}$
8. LL/Anal $2\frac{1}{2} - 4\frac{1}{2}$
9. Dorsal fin base equal to or greater than least depth of caudal peduncle.
10. One or two black spots.

TABLE - 1
Comparison of the Species of the "sophore" group

Characters	<i>Puntius sophore</i> (Ham), 1822, p.310	<i>Puntius terio</i> (Ham), 1822, P.313	<i>Puntius ticto</i> (Ham), 1822, p.314	<i>Puntius conchoni</i> (Ham), 1822, p.317	<i>Puntius shalynius</i> Yazdani & Talukdar, 1975, p .218
1. No. of barbels	NIL	NIL	NIL	NIL	NIL
2. Last unbranched dorsal ray	Ossified, smooth	Ossified	Ossified, serrated	Ossified, serrated	Ossified, serrated
3. Lateral line	Complete	Incomplete	Complete/Incomplete	Incomplete, after 9-10 scales	Incomplete, after 6 or 7 scales
4. LL Scales	23 to 25	23 or 24	21 to 26	24 to 26	20 to 23
5. PDS	8 or 9	10 or 11	8 to 11 (9-11)	9 to 11	9 to 11
6. LL/Dorsal	4 ¹ / ₂ to 5 ¹ / ₂	5 ¹ / ₂	4 ¹ / ₂ to 5 ¹ / ₂	5 ¹ / ₂	3 ¹ / ₂ to 4 ¹ / ₂
7. LL/Pelvic	3 ¹ / ₂ to 4 ¹ / ₂	3 ¹ / ₂	3 to 4 ¹ / ₂	3 ¹ / ₂ to 4 ¹ / ₂	2 ¹ / ₂ to 3 ¹ / ₂
8. LL/Anal	3 ¹ / ₂	2 ¹ / ₂	3 ¹ / ₂ to 4 ¹ / ₂	3 ¹ / ₂ to 4 ¹ / ₂	2 ¹ / ₂ to 3 ¹ / ₂
9. Circumpeduncular	9 or 10	6 or 7	10 to 12	10 or 11	9 or 10
10. Pre-pelvic	6 or 7	5	5 to 7	6 to 8	7 or 8
11. Pre-anal	14 or 15	11	11 to 14	16 to 18	12 to 14
12. Gill Rakers	4 to 6 + 15 to 17	2 + 3 to 6	2 to 4 + 5 to 7	1 to 3 + 8 to 10	2 or 3 + 10 to 12
13. SL/LH	2.25 to 3.71	3.00 to 5.70	2.89 to 4.30	2.50 to 4.06	2.92 to 3.85
14. SL/BD	1.96 to 3.46	2.05 to 3.07	2.29 to 3.70	2.12 to 2.94	2.64 to 3.49
15. LH/Eye	2.90 to 5.99	2.75 to 4.66	2.86 to 5.99	2.87 to 5.00	3.00 to 4.00
16. LH/Snout	2.14 to 4.16	2.99 to 3.80	2.22 to 4.00	2.67 to 4.00	3.25 to 4.00
17. IOW/Eye	1.00 to 2.00	1.00 to 1.60	1.00 to 1.60	1.12 to 2.00	1.00 to 1.43
18. Snout/Eye	1.00 to 1.25	1.00 to 1.81	1.20 to 2.00	0.87 to 1.40	2.67 to 3.75
19. LCPD/HCPD	1.07 to 2.00	3.41 to 4.54	1.11 to 2.0	1.12 to 2.00	1.12 to 1.62
20. Mouth Width/IND	=/less than	greater than	=/less than	greater than	less than
21. Dorsal fin base	greater than HCPD	greater than HCPD	greater than HCPD	greater than HCPD	greater than HCPD
22. Colour	2 Black spots on 4-6 and 22-24 scales	One spot above anal fin on 16-18 scale	2 Black spots on 3-5 and 16-20 scales	One Black spot on 18-19 scales	2 Black spots adjacent to each other on tail
23. Distribution	Wide	Restricted	Wide	Restricted	Restricted

Puntius sophore (Hamilton)

- Cyprinus sophore* Hamilton, *Fish. Ganges*, pp.310,389, p.119, fig.86, 1822 (type locality, ponds and rivers of Gangetic provinces).-McClelland, *Asiat. Res.*, 19(2) pp.285, 382, 1839.- Valenciennes, *Hist. Nat. poiss.*, 16, p.388, 1842.
- Systemus chrysopterus* McClelland, *Asiat. Res.*, 19, pp.285, 383, 1839 (type locality, Bengal and Assam).- Bleeker, *Verh. Bat. Gen.*, 25, p.60, 1853.- Mirza, *Biologia*, 17(1), p.451, 1971 (synonyms with *P. sophore* justified).
- Barbus chrysopterus*, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.152, 1863.- Day *Fish. India* p.579, pl.143, fig.6, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.329, 1889.- Hora, *Rec. Indian Mus.*, 22, p.744, 1921 (NE Burma, Naga hills).- Hora, *J. Asiat. Soc. Bengal.*, 22 p.125, 1926 (drawing in Burmes colln.).
- Barbus (Puntius) chrysopterus*, Haque, *Biologia*, 1(1), p.91, 1955 (scale structure).
- Puntius chrysopterus*, Sinha & Shiromany, *Rec. Indian Mus.*, 51, p.65, 1953 (name only, Hindan Nadi, Meerut).- Rahman, *Bull. FW. fish. Res. Stn. Chandpur*, No.1, p.8, 1974 (name only, checklist, Bangladesh, considered synonym of *P. stigma*).- Chattopadhyay, *Rec. zool. Surv. India*, 68(1-4), p.356, 1975 (Beliaghata Beri, Calcutta).- Sheri & Saied, *Bull. Hydrobiol. Res. Gordon Coll.* (1) 13, p.206, 1976 (treated as separate taxa; *P. sophore* synonymised detailed description).- Srivastava, *Fishes of UP & Bihar*, p.61, fig.42, 1980 (Key, description, treated as a separate taxa).- Jayaram, *Handbk. FW. fish. India*, p.100 (distribution). p.100 (Key) treated as a separate taxa) 1981.
- Systemus sophore* McClelland, *Asiat. Res.*, 19, pp.285, 382, 1839.- Jerdon, *Madras, J. Lit. & Sci.*, 15, p.316, 1849.- Bleeker, *Verh. Bat. Gen.*, 25, p.62, 1853.
- Leuciscus stigma* Valenciennes, *Hist. Nat. poiss.*, 17, p.93, pl.489, 1844 (type locality, Mysore).
- Leuciscus sulphureus* Valenciennes, *Hist. Nat. Poiss.* 17, p.96, 1844 (type locality, Mysore).- Bleeker, *Verh. Bat. Gen.*, 25, p.68, 1853.
- Leuciscus duvacellii* Valenciennes, *Hist. Nat. Poiss.*, 17, p.95, pl.491, 1844 (type locality, Bengal).- Bleeker, *Verh. Bat. Gen.*, 25, p.66, 1853.
- Systemus duvacellii*, Bleeker, *Ichth. Arch. Ind. Prodr.*, 2, p.278, 1860.
- Barbus duvacellii*, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.151, 1868.
- Puntius modestus* Kner, *Novara Fischi*, p.348, pl.15, fig.3, 1867.
- Barbus modestus* Gunther, *Cat. Fish. Brit. Mus.*, 7, 156, 1868.
- Barbus carletoni* Fowler, *Proc. Acad. Nat. Sci. Philad.*, 76, p.90, 1924 (type locality, Dehra Dun).
- Puntius carletoni*, Tilak, *Sci. & Cult.*, 36(11), p.613, 1970.(Dehra Dun, Hoshangabad, M.F., considered as a separate taxa).
- Barbus annandalei* Fowler, *Proc. Acad. nat. Sci. Philad.*, 76, p.87, 1924 (type locality, R. Sutej, Ludhiana).
- Barbus (Puntius) stigma*, Day, *Proc. zool. Soc. Lond.*, p.375, 1869.- Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (name only, synonymised with *sophore*).
- Barbus stigma*, Day, *Fish. India*, p.579, pl.141, fig.5, 1878.- Day, *Fauna Brit. India fish.*, 1, p.329, 1889.- Vinciguerra, *Ann. Mus. Civ. Stor. nat. Genoa*, (2) 9, p.300, 1889.- Annandale, *Rec. Indian Mus.*, 1, p.41, 1907 (name only, Port Canning, W. Bengal).- Chaudhuri, *Rec. Indian Mus.*, 6, p.15, 1911 (Bhamo, Burma).- Hora, *Rec. Indian Mus.*, 22, p.743, 1921 (foothills below Darjeeling).- Shaw & Shebbeare, *J. roy. Asiat. Soc. Bengal*, 3(1) p.42, text fig.37, pl.5, fig.1, 1937 (N. Bengal).- Venkateswarlu & Rama Rao, *Occ. Paper zool. Surv. India*, No.87, p.14, 1986 (synonym of *P. sophore*).
- Puntius stigma*, Day, *Proc. zool. Soc. Lond.*, p.375, 1869.- Motwani *et al*, *Trop. Zool.* 3 Cl & 21, p.20, 1962 C R. Brahmaputia, Assam.) Das & Nath, *Kashmir Sci.*, 8(1 & 2), p.5, 1971 (R. Tawi, Jammu) - Rahman, *Bull. FW. Fish. Res. Stn., Chandpur*, No.1, p.8, 1974 (name only, Checklist, Bangladesh).- Rahman, *Bangladesh J. Sci. & Indus. Res.*, 9(3 & 4), p.202 (name only, Bangladesh, Bengali name) p.154 (key for identification), 1974.- Chattopadhyay, *Rec. zool. Surv. India*, 68, p.356, 1975 (Beliaghata Beri, Calcutta). Jayaram & Singh. *Rec. zool. Surv. India*, 72, p.253, 1977 (Rivers Jamuna, Atari, Teesta, N. Bengal).

- Barbus sophore* Gunther, *Cat. Fish. Brit. Mus.*, 7, p.152, 1868.- Day, *Proc. zool. Soc. Lond.*, p.376, 1869.- Day, *Fauna Brit. India Fish.*, 1, p.309, 1889.- Chaudhuri, *Mem.Indian Mus.*, 5, p.436, 1916 (Chilka lake. Specific status and relationship with *P. stigma* clarified).- Raj, *Rec. Indian Mus.*, 12, p.256, 1916 (Madras).- Prasad & Mukerji, *Rec. Indian Mus.*, 31, p.202, 1929 (Indawgyi Lake, Burma).- Hora, *Curr. Sci.*, 1, pp.382, 383, 384, 385, 1933 (Uttarbhag, W. Bengal).- Hora & Mukerji, *Rec. Indian Mus.*, 36, p.355, 1934 (Nam Hok, Hawnlogk, Burma).- Prasad & Hora, *Rec. Malaria surv. India*, 6(4), p.641, 1936 (larvicidal properties).- Hora, *Rec. Indian Mus.*, 39, p.19, 1937 (Cauvery river, Coorg).- Hora, *Rec. Indian Mus.*, 40, p.174, 1938 (Sakrigali ghat, Povayal, Gumasii rivers, Santal Parganas).- Misra, *Rec. Indian Mus.*, 40, p.260, 1938 (Kodur, Padkonda, Nallamalai hills, E. ghats).- Das, *Rec. Indian Mus.*, 41, p.442, 1939 (Hazaribagh dist., Bihar).- Sinha & Shiromany, *Rec. Indian Mus.*, 51, p.62, 1953 (name only, Kali Nadi, Hindon Nadi, Garh-Mukteswar).- David, *Proc. nat. Inst. Sci. India*, 22 B (3), p.153, 1956 (Bhadra river at Bhardravati).- Dutt & Murty, *Mem. Soc. Zool. Guntur*, 1, p.7, 1975 (Kolleru Lake, Andhra Pradesh).
- Barbus (Puntius) sophore*, Hora, *Rec. Indian Mus.*, 38, p.1, 1936 (Chitaldrug dist., Kamataka).- Prasad & Hora, *Rec. Malaria surv. India*, 6(4), pl.14, fig.24, 1936 (larvicidal properties).- Hora & Mukherjee, *Health Bull.* (12), pl.6, fig.24, 1938. Hora, *Rec. Indian Mus.*, 42, (2), p.365 (Kusumkunda) p.367 (Sihawa), p.368 (Guttasilli), p.369 (Rudri Mahanadi, Dhamtari Bazar), 1940.- Hora & Law, *Rec. Indian Mus.*, 43 (2), p.237, 1941 (name only, distribution).- Hora & Nair, *Rec. Indian Mus.*, 43(3), p.366, 1941 (Itarsi, Hoshangabad dist., M.P.).- Hora & Gupta, *J. Asiat. Soc. Beng.*, 6(2), p.80, 1941 (Kalimpong, N. Bengal).- Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (name only, synonymy of *stigma* indicated).- Menon, M.A.S., *Rec. Indian Mus.*, 48 (1), p.71, 1950 (Isri river, Parasnath hills, Chota Nagpur).- Menon, *Rec. Indian Mus.*, 47(2), p.229, 1949 (Rivers Purana and Naya Pataya, Hoshiarpur dist., East Punjab).- Hora & Mathur, *Bull. Nat. Inst. Sci. India*, No.1, p.32, 1952 (Rajasthan).- Silas, *J. zool. Soc. India*, 3(1), p.7, 1951 (headwaters of Cauvery, Coorg).- Job, David & Das, *Indian J. Fish.*, 2(1), p.32, 1955 (Mahanadi below Hirakud dam).- Bhuiyan, *Asiat. Soc. Pakistan*, No. 13, fig. 1964 (Dacca).- Murty, *Proc. Indian Acad. Sci.*, 85 b (3), p.124, 1977 (Lake Kolleru, synonymy discussed).
- Puntius sophore*, Chauhan & Ramakrishna, *Rec. Indian Mus.*, 51, p.405, 1953 (Tel river, Balangir dist., Orissa).- Rajan, *J. Bombay nat. Hist. Soc.*, 53(1), p.45, 1955 (Bhavani & Moyar rivers, Nilgiri Hills).- Motwani & David, *J. zool. Soc. India*, 9(1), p.11, 1957 (Sone river, Bihar).- Karamchandani, *Tropical Ecology*, 3(1 & 2), p.80, 1962 (R. Ganga at Dighwara, Bihar).- Misra, *Rec. Indian Mus.*, 57(1-4), p.155, 1962 (brief description).- Menon, M.A.S., *Rec. Indian Mus.*, 59(1 & 2), p.44, 1963 (Chilka Lake).- Menon, *Rec. zool. Surv. India*, 59(4), p.380, 1966 (Veeranam Lake, Ponnaiyar river at Maddukkarai, Cuddalore, Pondicherry).- Mirza & Naik, *Pakistan J. Sci. Res.*, 19(2 & 3), p.114, 1967 (Bolan river, Baluchistan).- Datta & Majumdar, *Rec. zool. Surv. India*, 62(1 & 2), p.89, 1970 (Rajasthan).- Mirza, *Biologia*, 16(2), p.83, 1970 (R. Ravi, Lahore, Pakistan).- Sen et al., *Seafood Export J.*, 11(1), p.3, 1970 (local name, Calcutta).- Srivastava et al., *Rec. zool. Surv. India*, 64(1-4), p.132, 1970 (R. Ken, Banda dist., U.P.).- Mirza, *Pakistan J. Zool.*, 3(2), p.241, 1971 (Makran, Baluchistan).- Menon et al., *Sci. & Cult.*, 38, p.341, 1972 (Hooghly river, Pulda stretch).- Mirza, *Biologia*, 18(2), p.167, 1972 (Sibi, Kalat districts, Las Bela, Pasni, Baluchistan).- Venkateswarlu, *Indian J. Zootomy*, 13(3), p.122, 1972 (name only, Bihar).- Mirza, *Biologia*, 22(1), p.115, 1972 (name only, montane and submontane regions of Pakistan).- Mirza, *Pakistan J. Zool.*, 5, p.209, 1973 (presence of fronto parietal fontanel).- Venkateswarlu & Rama Rao, *Seafood Export J.* 5(6), p.3, 1973 (vernacular names in Gangetic delta).- Mirza, *Biologia*, 20(1), p.781, 1974 (name only, South and South East Baluchistan, Indus Plain and adjoining hills).- Mirza & Ahmad, *Biologia*, 20(1), p.100, 1974 (name only, D.I. Khan, Pakistan).- Menon, *Spl. Publ.*, No.1, *Int. Fish. Soc. India*, p.40, 1974 (checklist, Himalayan & Indo-Gangetic fishes).- Bashir & Mirza, *Bull. hydrobiol. Res. Gordon Coll.*, (1) 9, p.95, 1975 (R. Sutlej, Chandpur).- Omer & Mirza, *Biologia*, 21(2), p.202, 1975 (Abbottabad, Hazara district, Pakistan).- Mirza, *Bijdr. Dierk.*, 45(2), p.169, 172, 1975 (Aba-Sinh division, Indus plain, adjoining hills, South Baluchistan).- Mirza, *Biologia*, 22(1), p.115, 1972 (name only, montane and submontane regions of Pakistan).- Srivastava & Venkateswarlu, *Indian J. Zootomy*, 17(3), p.181, 1976 (name only, local name, plains of U.P.).- Jayaram & Majumdar, *Rec. zool. Surv. India*, 76, p.314, 1976 (Mahanadi, Orissa & M.P.).- Venkateswarlu, *Acta Ichthyol. Piscatoria*, 6(2), p.92, 1976 (R. Poonpun, Ganga, Gandak).- Singh, *Rec. zool. Surv. India*, 71, p.123, 1976 (Raxaul Darbhanga, Jharai river, N. Bihar).- Pillai & Yazdani, *Rec. zool. Surv. India*, 72, p.5, 1977 (Garohills, Meghalaya).- Venkateswarlu, *Acta Ichthyol. Piscatoria*, 7(1), p.49, 1977 (River Poonpun, Bihar).- Jayaram & Singh, *Rec. zool. Surv. India*, 72, p.253, 1977 (Rivers Kalindri, Teesta, Dharala, Jaldhaka, N. Bengal). Sadig & Mirza, *Pakistan J. zool.*, 10(2), p.299, 1978 (Dharma and Tounsa, Multan, Pakistan).- Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*, 9(1), p.52, 1979 (name only, list of Ganga fishes).- Mirza, *Proc. 1st. Pakistan Congr. Zool.*, p.16,

1980 (checklist, distribution in Pakistan & Azad Kashmir).- Srivastava, *Fishes of UP & Bihar*, p.69, fig.48, 1980 (Key, description).- Butt & Mirza, *Biologia*, 27(2), p.155, 1981 (Peshawar Valley, NWF. Pakistan).- Jayaram, *Handbk. FW. fish. India*, p.102 (distribution), p.110 (key), 1981.- Jayaram, *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.63, 1982 (Key, Cauvery river, S. India).- Mirza & Abdussamad, *Biologia*, 28(1), p.67, 1982 (description, Pakistan).- Mirza, *Fish. Lahore*, p.13, fig. 1982 (Lahore, brief diagnosis).- Mirza & Omer, *Biologia*, 30(1), p.81. 1984 (Key, Baluchistan).- Husain & Tilak, *Rec. zool. Surv India*, 81, p.274, 1984 (name only, Faizabad dist., U.P.).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.38, 1984 (Common & Vernacular names).- Sen, *Occ. Paper zool. Surv. India*, No.64, p.78, 1985 (Assam).- Lipton, *Matsya*, 9 & 10, p.111, 1985 (Tripura).

Vernacular Names : *Puthi*, Ass; *Punti*, *Puti*; Beng; *Katcha karawa*, *Pottiah*, *Sidhari*, Hindi; *Katcha karawa*, *Kolla kendai*, Kan; *Unda kanni*, Mal; *Kudale*, Mar; *Patia Kerundi*, Ori; *Ticker*, *Chidhu*, Punj; *Sallikendi*, *Sarmudi*, *Kuran chalbi*, *Kulla kendai*, *Vella kendai*, *Chand kendai*, Tam; *Budda Pakke*, *Chedu Parega*, *Chedu parigi*, Tel.

Specimens Studied : ZSI, SRS unreg. 5 ex., 40 to 51 mm SL, Kulithalai, Cauvery river, KCJ Coll., 5.4.1973. ZSI, HFAS, unreg. 1 ex., 75 mm SL, No locality; ZSI, SRS, unreg., 2 exs., 66 & 68 mm SL, Cauvery at Hole Narsipur, Karnataka, KCJ Coll. ZSI, SRS, unreg. 2 exs., 32 & 75 mm SL Erode, KCJ Coll. ZSI, F, 4023/2, 66.0 to 102.0 mm SL, Gadhuli Talai, Shergarh, Rajasthan, SE Rajasthan Survey, 22.6.1963. ZSI, F.4008/2 4 exs., 62.5 to 70.0 mm SL, Sukla Talai, Jhalawar, Rajasthan, N.Majumdar & R.N. Bhargava Coll, 20.6.1963. ZSI, F.4029/2, 4 exs., 58.0 to 67.5 mm SL, Talbi, N. of Bimmal Railway Station, S.E.Rajasthan Survey, 30.6.1983.

Diagnosis : A deep bodied fish without any bands on body, no barbels, dorsal ray osseous, smooth, lateral line complete. A round black spot on 22 to 24th scale conspicuous, another on 4 to 6 often inconspicuous and a black blotch at base of dorsal fin.

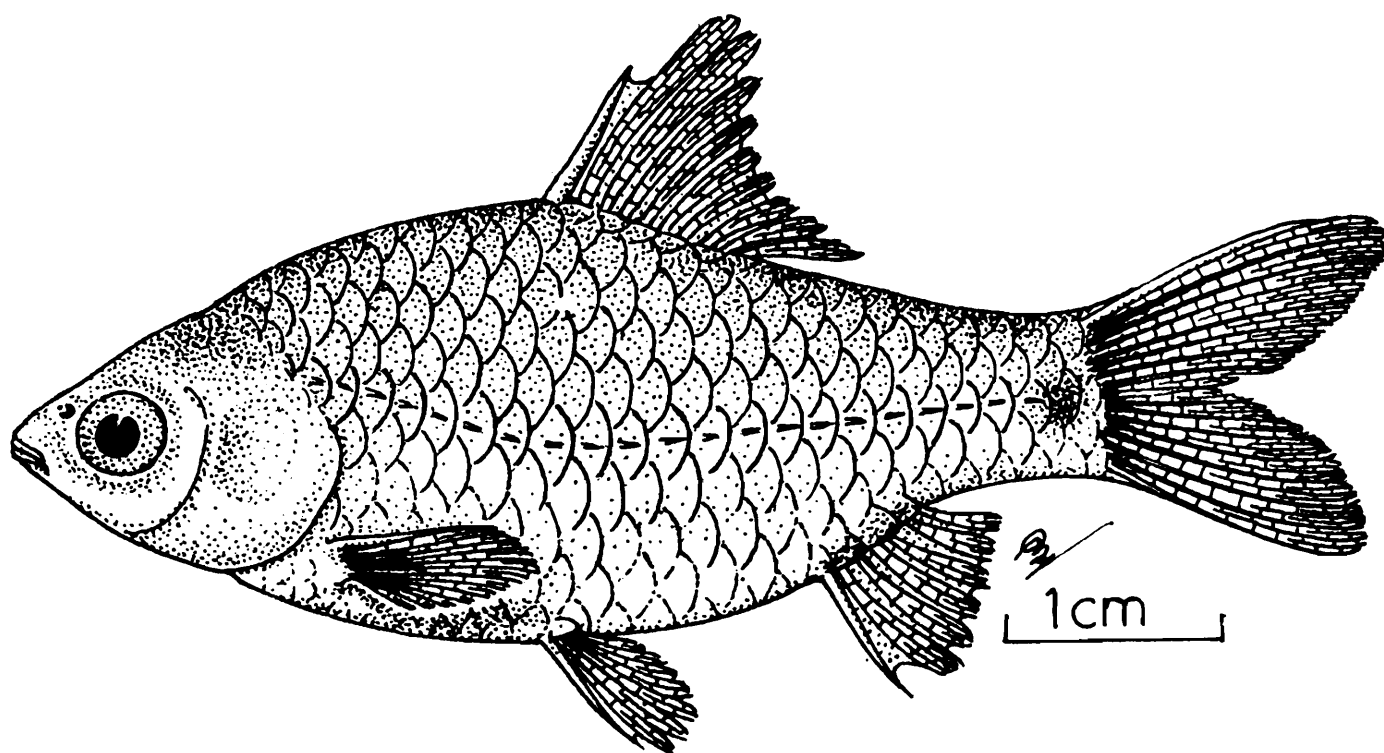
Description : D.11-111, 8; P. 14-15; V i,8; A.i-ii, 5; C. 17-19; LL. 23-25.

Dorsal and ventral profiles gently arched. Head small, moderately blunt. Head length 26.92 to 44.44; body depth 28.90 to 51.02 in percent of standard length. Head width 37.59 to 75.19, height of head at occiput 50.00 to 100.00, snout 24.03 to 46.73 in percent of head length. Snout moderately pointed, plain. Eyes moderate, 16.67 to 34.48 in percent of head length, 50.00 to 100.00 in percent of interorbital width, 80.00 to 100.00 of snout length. Mouth antero-superior, its width equal to or less than inter-nostrill distance. Both lips equally reflected. No barbels.

Dorsal fin inserted nearly midway between tip of snout and caudal base. Last unbranched dorsal ray ossified into a smooth spine. Dorsal fin base greater than depth of caudal peduncle. Pectoral fins do not extend to pelvic fins; latter reach the anal opening. Anal fin when laid flat not reaching root of caudal fin. Least height of caudal peduncle 50.00 to 93.45 in percent of its length. Lateral line complete.

Scales : PDS 8 or 9; Pre anal 14 or 15; Pre pelvic 6 or 7

Between LL and dorsal fin base	4 $\frac{1}{2}$ to 5 $\frac{1}{2}$
Between LL and dorsal fin base	3 $\frac{1}{2}$ to 4 $\frac{1}{2}$
Between LL and dorsal fin base	3 $\frac{1}{2}$
Circumpeduncular	9 or 10



Lateral view of *P. sophore*

Gill Rakers : 4 to 6 + 15 to 17

Size 180 mm TL

Colour : In alcohol preserved specimens, medium brown on dorsal and upper half of lateral sides, ventral and lower half yellowish brown, fins light yellow and black tipped. A black spot at base of caudal fin on 22 to 24th scale, another at the base of 4 to 6th ray of dorsal fin. Gill Covers diffusely spotted golden.

Distribution : Widely distributed in India, Pakistan, Nepal, Bangladesh, Burma, Sri Lanka.

Relationship An unique species which has given rise to several others and whose origin is linked to other Cyprinine genera. Within the *Puntius* group of species dealt with here it is close to *P. chola*.

Remarks : Hamilton (1822) described this species as *Cyprinus sophore* deriving the specific name from Sanskrit meaning "a beautiful little fish" He found it to be common in the ponds of Bengal. He gave an illustration of this species in figure 86 of plate VI of his Gangetic fishes. He stated in describing the fish that it has two black spots, one at the caudal fin base and another at the base of the dorsal fin. However in the following para of the above he inadvertently cited the fish as having five spots which is an error. Similarly in respect of the barbels also some mistatements have been made. In the text the fish is said to have four very minute barbels (two pairs) which however is not shown in his illustration nor about which he has indicated in his synoptic table on page 42.

This inconsistency in the text and also between the text and the figure has caused much confusion McClelland (1809), Valenciennes (1842). Gunther (1868) all considered *P. sophore* as without barbels. Day (1869, 1878, 1889) alone refuted this and asserted that *P. sophore* is one species which definitely possesses four barbels, irrespective of the fact that it had no resemblance to the figure nor to other aspects of description in the text of Hamilton. In support of his contention Day had before him a "bleached" specimen of a small *Barbus* without any locality or donor which had four long barbels. Further, Day received from R. Beaven a lot of 12 others small *Barbus*, 24 to 58 mm SL, from Khasia Hills, which also he referred as similar to the bleached specimen. Another specimen purchased by Day on 8th Sept. 1879 was also labelled as *B. sophore* by Day himself in his own handwriting. This fish. 117 mm SL came from Bassein, Burma and has a pair of maxillary barbels and is without any colour spots. Day erroneously concluded that all the above 14 examples represented *P. sophore* and also that the bleached specimen without a locality label also came from Khasia Hills.

Thus, Day used the name "*sophore*" for two very different fishes, one from Khasia Hills and another from Burma. It may be noted here that Hamilton received no collection either from Khasia Hills or Burma. Murty (1977) dwelt at length this problem of material so called "*sophore*" by Day and suggested that it represents a species without a valid name. Unfortunately these specimens are not now traceable in the ZSI. *P. sophore* and *P. chola* are akin in many aspects and it is quite likely some mix up has taken place in the identification. In the absence of the disputed material nothing definite can be said.

Day adopted the name *B. stigma* for his fish from Bengal, which name was given by Valenciennes for a small *Barbus* from Mysore. Hamilton clearly showed that this fish of Valenciennes from Mysore is a local race of *sophore* (see Hamilton's definition in Latin in the synoptic table No.42, p.389 in Gangetic fishes; and also fig.86, pl.19). Thus it is clear that *B. stigma* is a synonym of *B. sophore* and the latter is without any barbels.

Raj (1916) recorded dozen specimens of this species from a pond behind the Madras Museum. Three specimens have nine or ten pre-dorsal scales and three rows of scales between the lateral line and pelvic fins. All these have a pair of maxillary barbels. Two other specimens have no barbels, scales on the lateral line are 26. The first three may be *P. chola* and the last two *P. sophore*.

Hora (1938) observed this fish in fresh and brackish waters. It is not taken as food due to its small size. It feeds on aquatic plants, algae, bryozoans, rotifers, crustaceans insects, their larvae and bivalve molluscs occasionally. During the breeding season a scarlet streak appears on the lateral line which is more prominent in males (Ahmed, 1943).

Puntius chrysopterus is a synonym of this species due to its scale count, fin formulae, count of pharyngeal teeth, gill rakers, and vertebral count falling within the range of variation of this species (Mirza, 1971).

Additional Data

TL/Head length	16.31 to 24.56	N = 19
TL/Body depth	26.95 to 32.76	N = 19
SL/Pre dorsal	45.71 to 56.25	N = 22

SL/Pre anal	65.00 to 82.35	N = 22
SL/Pre pelvic	44.89 to 52.22	N = 22
SL/LCPD	50.00 to 82.36	N = 22
LH/HCPD	45.00 to 90.00	N = 22
LH/Dorsal fin base	50.00 to 74.67	N = 22
LH/Width of Mouth	18.52 to 30.00	N = 22

Puntius terio (Hamilton)

Cyprinus terio Hamilton, *Fish. Ganges*, pp.313, 389, 1822 (type locality, North Eastern Bengal).- McClelland, *Asiat. Res.*, 19, pp.286, 385, pl.44, fig.7 (Hamilton MS drawing), 1839.- Valenciennes, *Hist. Nat. Poiss.*, 16, p.398, 1842.

Systemus guibbosus McClelland, *Asiat. Res.*, 19 pp.286, 385, pl.44, fig.7 (Bengal, Hamilton's Ms drawing), 1839.

Systemus terio, Bleeker, *Verh. Bat. Gen.*, 25, p.62, 1853.

Barbus terio, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.153, 1868.- Day, *Proc. zool. Soc. Lond.*, p.376, 1869.- Day, *Fish. India*, p.580, pl.144, fig.3, 1878.- Day, *Fauna Brit. India*, 1, p.330, 1889.- Hora, *Rec. Indian Mus.*, 25, p.383, 1923 (Kas Gandhala, Salt Range, Pakistan).- Hora, *Rec. Indian Mus.*, 40, p.174, fig.2, 1938 (Sakrigalighat, Damra, Gumani, Purayal river, Santal Parganas).- Prasad & Hora, *Rec. Malaria Surv. India*, 6, (4), p.637, 1936.

Puntius terio, Mirza, *Biologia*, 18(2), p.168, 1972 (record of Day from Bolan Pass, Baluchistan quoted).- Venkateswarlu, *Indian J. Zootomy*, 13(3), p.122, 1972 (name only, Bihar).- Mirza, *Biologia*, 20(1), p.79, 1974 (South & South East Baluchistan, Indus plain and adjoining hills, name only.-) Rahman, *Bangladesh J. Sci. & Indus. Res.*, 9(3 & 4), p.154 (Key for identification), p.202, 1974 (name only, Bangladesh, Bengali name).- Rahman, *Bull. FW. fish. Res. Stn. Chandpur*, No 1, p.i, 1974 (name only, Checklist, Bangladesh).- Menon, *Spl. Publ. No. 1, Int. Fish. Soc. India*, p.42, 1974 (checklist of Himalayan and Indo-Gangetic fishes).- Chattopadhyay, *Rec. zool. Surv India*, 68(1-4), p.556, 1975 (Beliaghata Beri).- Mirza, *Bijdr. Dienk.*, 45(2), p.172, 1975 (Indus plain, adjoining hills, S. Baluchistan).- Mirza, *Biologia*, 22(1) p.115, 1976 (name only, Montane and submontane regions of Pakistan). Sen, *Seafood Export J.*, 10(1), p.3, 1978 (Assam, local and English names).- Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*, 9(1), p.52, 1979 (name only, list of Ganga fishes).- Mirza, *Proc. Ist. Pakistan Congr. Zool.*, p.16, 1980 (checklist, distribution in Pakistan and Azad Kashmir).- Jayaram, *Handbk. FW. fish. India*, p.103 (distribution) p.109 (key) 1981.- Mirza & Abdussamad, *Biologia*, 28(1), p.71, 1982 (description, Pakistan).- Mirza & Omer, *Biologia*, 30(1), p.81, 1984 (Key, Baluchistan).- Sen, *Occ. Paper zool. Surv India*, No.64, p.85, 1985 (Assam).

Vernacular Names : Teri pungti, Beng. *Kakachia kerundi*, Ori.

Specimens Studied : ZSI, F.7312-19/1, 8 exs., 9.0 to 14.00 mm SL., Kalka Hill stream, Dr. N. Annandale Coll, May 1911. ZSI, F.2303, 3 exs., 12.0 to 34. mm SL., Orissa, F. Day coll.

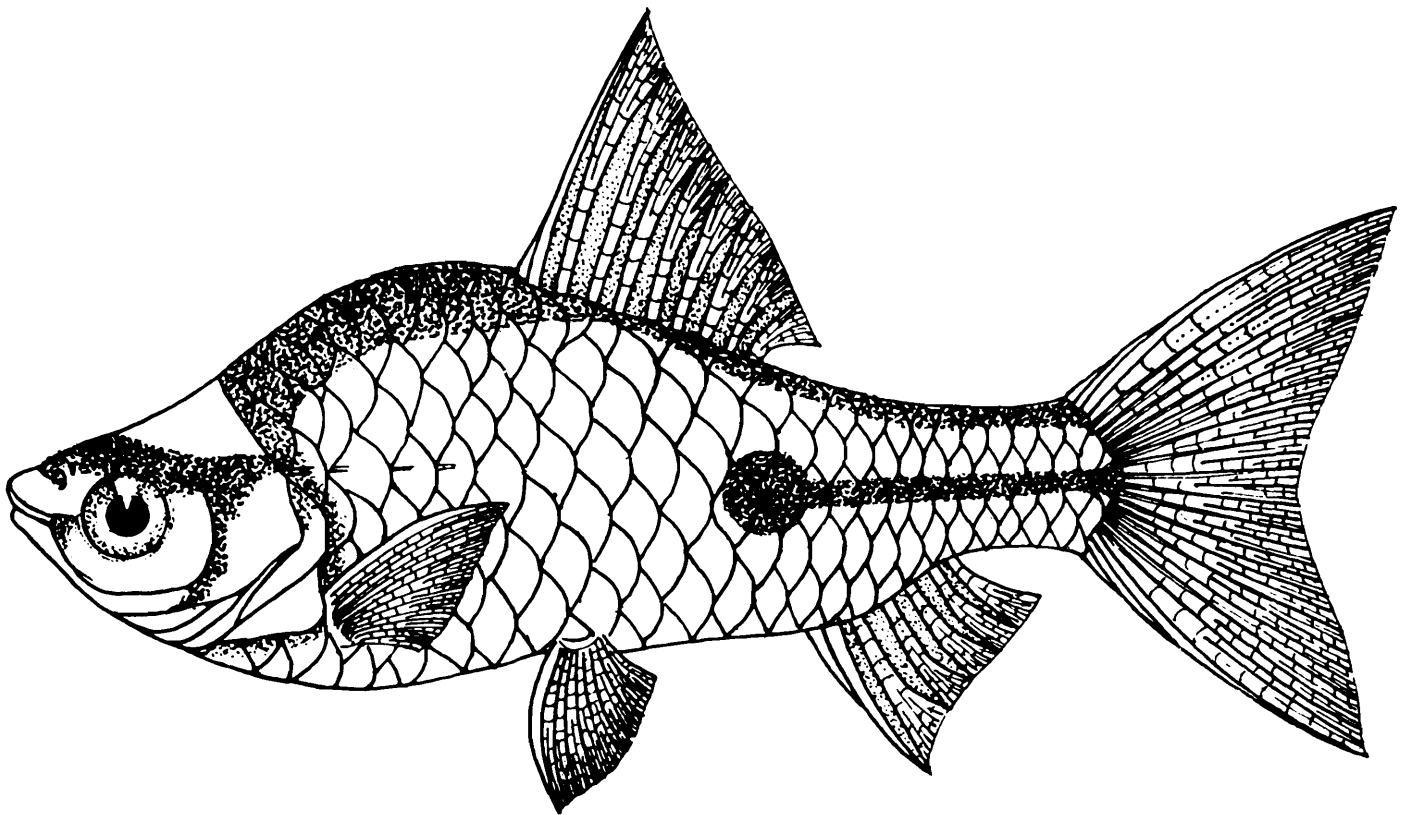
Diagnosis : A moderately deep bodied fish without any vertical colour bands on body, without barbels, dorsal ray ossified, smooth, and lateral line incomplete with 23 or 24 scales.

Description : D. II-III,8; P. 14-15; V. 9; A.ii-iii,5; C.19; LL.23-24.

Dorsal profile arched greatly, ventral profile slightly. Head small, bluntly pointed. Head 17.54 to 33.33, body depth 32.57 to 48.78 in percent of standard length. Head width 50.00 to 90.09, height of head at occiput 77.52 to 100.00, snout 26.31 to 43.48 in percent of head length. Snout plain, moderately blunt. Eyes moderate, 21.46 to 36.36 in percent of head length, 62.50 to 100.00 in percent of interorbital width, and 55.00 to 100.00 of snout length.

Mouth antero-superior, its width greater than inter-nostrill distance. Both lips reflected equally. No barbels.

Dorsal fin inserted midway between tip of snout and caudal fin base, occasionally nearer caudal base. Last unbranched dorsal ray ossified, moderately strong, smooth. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins do not extend to pelvic fins, latter not reaching the anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 21.98 to 29.24 in percent of its length. Lateral line incomplete ceasing after 3 or 4 scales.



Lateral view of *P. terio*

<i>Scales</i>	PDS 10 or 11; Pre-anal 11, Pre-pelvic 5
	Between LL and Dorsal fin base $5\frac{1}{2}$
	Between LL and Pelvic fin base $3\frac{1}{2}$
	Between LL and anal fin base $2\frac{1}{2}$
	Circumpeduncular 6 or 7

Gill Rakers 2 or 3 + 6

Size : 100 mm TL

Colour : Blackish along back and above lateral line, yellowish-white below. A black spot on tail, on 16th to 18th scale, fins whitish.

Distribution : INDIA: Orissa, West Bengal, Assam, Bihar, E. Punjab. Pakistan, Bangladesh.

Remarks : Attaining 3-4 inches this fish is mainly a phyltoplankton feeder.

Relationships : Related to *P. sophore* differing from it in having an incomplete lateral line, less number of lateral line scales and colouration.

Additional Data

TL/Head length	—
TL/Body depth	—
SL/Pre dorsal	50.00 to 56.25
SL/Pre anal	75.00 to 79.16
SL/Pre pelvic	56.25 to 62.50
LH/LCPD	66.66 to 80.00
LH/HCPD	55.55 to 70.00
LH/Dorsal fin base	40.00 to 66.66
LH/Width of Mouth	20.00 to 22.22

***Puntius ticto* (Hamilton)**

Cyprinus ticto Hamilton, *Fish. Ganges*, pp.314, 398 pl.8, fig.87, 1822 (type locality, south-eastern parts of Bengal).

Systomus ticto, Mc Clelland, *Asiat. Res.*, 19, p.382, 1839.- Bleeker, *Verh. Bat. Gen.*, 25, pp.62, 128 1853.

Barbus (Puntius) ticto, Hora & Law, *Rec. Indian Mus.*, 43(2), p.248, 1941 (Achenkovil, Central Kerala).- Menon, *Rec. Indian Mus.*, 47(2), p.229, 1949 (Rivers Purana and Naya Pataya, Hoshiarpur dist., Punjab).- Job, David & Das, *Indian J. fish.*, 2(1), p.33, 1955 (Mahanadi below Hirakud Dam).- Bhuiyan, *Asiat. Soc. Pakistan*, No.13, p.35, fig.1964 (Dacca).

Barbus ticto, Gunther, *Cat.Fish. Brit. Mus.*, 7, p.153, 1868.- Day, *Fish. India*, p.576, pl.144, fig.7, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.325, 1889.- Regan, *Rec. Indian Mus.*, 1, p.157, 1907 (Bhim tal lake, Nainital).- Jenkins, *Rec. Indian Mus.*, 3, p.287, 1909.-Chaudhuri, *Rec. Indian Mus.*, 8, p.251, 1913 (Abor hills).- Annandale, *Rec. Indian Mus.*, 16, p.135, 1919.- Hora, *Rec. Indian Mus.*, 22, p.187, 1921 (Manipur Valley) - Hora, *Rec. Indian Mus.*, 22, p.744, 1921 (border of Burma and Naga hills).- Hora, *Mem. Indian Mus.*, 5(11), p.744, 1923 (Chilka Lake).- Hora & Mukherji, *Rec. Indian Mus.*, 37(3), p.375 (name only, Deolali).- Hora & Mukerji, *Rec. Indian Mus.*, 37, p.389, 1935 (Mohumi, Naga hills).- Hora, *Rec. Indian Mus.*, 38(3), p.331, 1936 (Chang chang, Naga hills).- Hora & Prashad, *Rec. Malaria surv. India*, 6(4), p.641, 1936 (larvicidal properties).- Hora & Mukerji, *Rec. Indian Mus.*, 38, p.134, 1936 (Song, Suswa rivers and Loons).- Shaw & Shebbeare, *J. Asiat Soc. Beng.*, 3, p.43, fig.38, pl.5, fig.10, 1937 (River Mahanadi and Panchenai, Terai, N. Bengal).- Hora, *J. Bombay nat. Hist. Soc.*, 40, p.28, fig.3, 1938.- Hora, *Rec. Indian Mus.*, 39, p.7 (Tunga river at Shimoga) p.8 (Kotteghar village, Sulekere tank), p.16 (Sagar, Shimoga dist.) p.17 (Bhanra river, Bhadravati), p.19 (Cauvery, Coorg), 1937.- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 39(3), p.504 (Dama river) p.506 (Waldi river) p.507 (Narsullah Wadi, Bagoor), p.510 (Aounda river), p.513 (Godavari river), p.517 (Lake Beak, Deolali), 1937.- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 40(1), p.28, text.fig.3, 1938 (Deolali).- Hora, *Rec. Indian Mus.*, 40, p.175, 1938 (Rivers Gumani, Povayal, Santal parganas).- Hora, *Rec. Indian Mus.*, 40, p.240, 1938 (Timinar, Bailadila Range).- Misra, *Rec. Indian Mus.*, 40, p.260, 1938 (Kodur, Nallamalai hills, E. ghats).- Das, *Rec. Indian Mus.*, 41, (4), p.441, 1939 (Hazaribagh dist., Bihar).- Hora, Misra & Malik, *Rec. Indian Mus.*, 41, p.273, 1939 (variations discussed).- Chacko, Krishnamurthi & George, *Contrib. FW. Fish. Biol. Stn., Madras*, No.3, p.3, 1952 (Kanigiri, Duvvur reservoir, Pennar, Andhra Pradesh).- Shetty, *Proc. Nat. Acad. Sci.*, B, 35(1), p.126, 1965 (Venbanad Lake, Kerala).- Silas, *J. Zool. Soc. India*, 3(1), p.7, 1951 (headwaters of Cauvery, Coorg) - Murty, *Proc. Indian Acad. Sci.*, 85 B (3), p.128, pl.3, fig.4, 1977 (description, Lake Kolleru, synonymy discussed).

- Barbus (Puntius) ticto* Hora, *Rec. Indian Mus.*, 38(1), p.1 (Chitaldrug dist., Karnataka).- Prashad & Hora, *Rec. Mal surv. India*, 6(4), pl.14, fig.26, 1936 (larvicidal properties).- Hora & Mukerji, *Health Bull.*, no.12, pl.6, fig.26, 1938 (larvicidal properties).- Hora, Misra & Malik, *Rec. Indian Mus.*, 41(3) pp.263-279, 1939 (variations analysed).- Hora, *Rec. Indian Mus.*, 42(2), p.363 (Kusum khunta), p.366 (Sihawa), p.368 (Gattasilli, Banroud), p.369 (Dhamtari Bazaar, Mahanadi, M.P.), 1940.- Hora & Law, *Rec. Indian Mus.*, 43(2), p.248, 1941 (Achenkovil, Kerala).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 42(3), p.479, 1941 (Dalu, Upper Chindwin, Burma).- Hora & Nair, *Rec. Indian Mus.*, 43(3), p.364 (Pachmarhi), p.365 (Singanama), p.366 (Maccha stream, Itarsi), p.567 (Harda, Hoshangabad dist., M.P.), 1941.- Hora & Gupta, *J. Asiatic Soc. Beng.*, 6(2), p.79, 1941 (Kalimpong duras, N. Bengal).- Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (name only, distribution, synonyms indicated).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 43(2), p.220, 1942 (name only, Poona).- Menon, *Rec. Indian Mus.*, 48(1), p.71, 1950 (Isri river, Parsanath hills, Chota Nagpur).- Silas, *J. Bombay nat. Hist. Soc.*, 47(4), p.674, 1951 (Vannamadi Bridge, Anaimalai, Ponnani drainage).- Hora & Mathur, *Bull. Nat. Inst. Sci. India*, No.1, p.32, 1952 (name only, Rajasthan).
- Puntius ticto*, Hora, *J. zool. Soc. India*, 1(1), p.2, 1949 (Rihand river).- Deraniyagala, *Spolia Zeylanica*, 16(1), p.21, 1930 (description, distribution in Sri Lanka).- Herre, *Spolia Zeylanica*, 24(3), p.175, 1946 (Peradeniya).- Silas, *Bull. Nat. Inst. Sci. India*, No.7, p.251, 1952 (name only, Sri Lanka).- Silas, *Proc. nat. Inst. Sci. India*, 18(5), p.424, 431 (*punctatus*, *stoliczkanus* considered as subspecies), 1952.- Sinha & Shiromany, *Rec. Indian Mus.*, 51, p.65, 1953 (Meerut city).- Silas, *Rec. Indian Mus.*, 51(1), p.28, 1953 (Tambaparni river).- Chauhan & Ramakrishna, *Rec. Indian Mus.*, 51, p.405, 1953 (Tel river, Balangir dist., Orissa).- Silas, *J. Bombay nat. Hist. Soc.*, 51, p.581, 1953 (Yenna, & Krishna rivers at Wai, Maharashtra).- Munroe, *Marine & FW. Fish. Ceylon*, p.46, 1955 (Sri Lanka).- Menon, *Rec. Indian Mus.*, 52(1), p.22, 1956 (Manipur).- Karamchandani, *Tropical Ecology*, 3(1 & 2), p.80, 1962 (R. Ganga at Dighwara, Bihar).- Misra, *Rec. Indian Mus.*, 57(1-4), p.156, 1962 (brief description).- Menon, M.A.S., *Rec. Indian Mus.*, 59(1 & 2), p.44, 1963 (Chilka Lake).- Mirza, *Pakistan J. Sci.*, 17(5 & 6), p.249, 1965 (Kalat dist., Baluchistan).- Mirza & Naik, *Pakistan J. Sci. Res.*, 19(2 & 3), p.114, 1967 (Bolan river, Baluchistan).- Datta & Majumdar, *Rec. zool. Surv India*, 62(1 & 2), p.89, 1970 (Rajasthan).- Mirza, *Biologia*, 16(2), p.83, 1970 (R. Ravi, Lahore, Pakistan).- Pant, *Rec. zool. Surv India*, 64(1-4), p.87, 1970 (Almora, Kumaon).- Sen *et al.*, *Seafood Export J.* 11(1), p.3, 1970 (local name, Calcutta).- Das & Nath, *Kashmir Sci.*, 8(1 & 2), p.4, 1971 (Tawi river, Jammu).- Mirza, *Biologia*, 18(2), p.167, 1972 (Sibi, Kalat district, Baluchistan).- Venkateswarlu, *Indian J. Zootomy*, 13(3) p.122, 1972 (name only, Bihar).- Mirza, *Pakistan J. Sci.*, 25(4-6), p.253, 1973 (Kohat, Kachai, Pakistan; sexual dimorphism described).- Mirza, *Biologia*, 19, p.124, 1973 (Swat valley, Bumer valley, W. Pakistan), p.126 (river Indus, near Gazi).- Venkateswarlu & Rama Rao, *Seafood Export J.*, 5(6), p.3, 1973 (vernacular names in Gangetic delta).- Mirza, *Biologia*, 20(1), p.76, 1974 (Nari Bolan headwaters, NE Baluchistan), p.78 (South & SE Baluchistan, Indus plain & adjoining hills).- Mirza & Ahmed, *Biologia*, 20(1), p.100, 1974 (name only, D.I. Khan, Paharpur Canal and Orazonda).- Mirza & Omer, *Pakistan J. Zool.* 6(1 & 2), p.193, 1974 (River Haro, Hasan Abdal, Punjab, Pakistan).- Menon, *Spl. Publ. No.1, Int. Fish. Soc. India*, p.42, 1974 (Checklist of Himalayan & Indo-Gangetic fishes).- Rahman, *Bangladesh J. Sci. & Indus Res.*, 9(3 & 4) p.202 (name only, Bangladesh, Bengali name), p.154 (key for identification), 1974.- Rahman, *Bull. Fw. Fish. Res. Stn. Chandpur*, No.1, p.8, 1974 (name only, checklist, Bangladesh).- Bashir & Mirza, *Bull. hydrobiol. res. Gordon Coll.*, (1) 9, p.94, 1975 (R. Sutlej, Gundasingwala).- Omer & Mirza, *Biologia*, 21(2), p.202, 1975 (Abbotabad, Chamba bridge (Havelian), Haripur, Tarbela, Ghazi Hazara district, Pakistan).- Mirza, *Bijdr. Dierk.*, 45(2), p.169, 1975. (Aba-Sinh division, Indus Plain, S. Baluchistan).- Chattopadhyay, *Rec. zool. Surv India*, 68(1-4), p.356, 1975 (Beliaghata Beri, Calcutta).- Jayaram & Majumdar, *Rec. zool. Surv. India*, 76, p.314, 1976 (R. Mahanadi, Orissa & M.P.) Mirza, *Biologia*, 22(1), p.115, p.1976 (name only, montane and submontane regions of Pakistan).- Rao, *Matsya*, 2, p.57, 1976 (Godavari estuary).- Sriwastava & Venkateswarlu, *Indian J. Zootomy*, 17(3), p.181, 1976 (name only, local name, Kumaon, U.P.).- Singh, *Rec. zool. Surv India*, 71, p.124, 1976 (Jharai river, Saran dist.).- Pillai & Yadani, *Rec. zool. Surv India*, 72, p.5, 1977 (Garo hills, Meghalaya).- Venkateswarlu, *Acta Ichthyol. Piscatoria*, 7(1), p.50, 1977 (R. Poonpun, Bihar).- Jayaram & Singh, *Rec. zool. Surv. India*, 72, p.253, 1972 (Rivers Teesta, Dharala, N. Bengal).- Sadiq & Mirza, *Pakistan J. Zool.*, 10(2), p.299, 1978 (Tounsa, Manka canals, Multan Dist., Pakistan).- Sen, *Seafood Export J.*, 10(1), p.3, 1978 (Assam, local & english names).- Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*, 9(1), p.52, 1979 (name only, list of Ganga fishes).- Mirza, *Proc. Ist. Pakistan Congr. Zool.*, p.16, 1980 (checklist, distribution in Pakistan and Azad Kashmir).- Srivastava, *Fishes of UP & Bihar*, p.70, fig.49, 1980 (key, description).- Butt & Mirza, *Biologia*, 27, p.155, 1981 (Peshawar valley, NWFP, Pakistan).- Mirza, *Fish. Lahore*, p.13 fig. 1982 (Lahore, brief diagnosis).- Mirza & Abdussamad, *Biologia*, 28(1), p.75, 1982 (description Pakistan).- Mirza & Omer, *Biologia*, 30(1), p.81, 1984 (key, South East Baluchistan).- Husain & Tilak, *Rec. zool. Surv. India*, 81, p.274,

1984 (name only, Faizabad dist., U.P.).- Sen, *Occ. Paper zool. Surv. India* No.64, p.82, 1985 (Assam).- Lipton, *Matsya*, 9 & 10, p.111, 1985 (Tripura).

Puntius ticto ticto, Rajan, *J. Bombay nat. Hist. Soc.*, 53(1), p.45, 1955 (Bhavani, Moyar rivers, Nilgiri hills).- Motwani & David, *J. zool. Soc. India*, 9(1), p.3, 1957 (Sone river, Bihar).- Motwani *et al.*, *Trop. zool.* 3(1 & 2), p. 20, 1962. (R.Brahmaputra, Assam).- Rajan, *Proc. Indian Acad. Sci.*, 58, p.296 1963 (Moyar river, Nilgiri hills).- Srivastava *et al.*, *Rec zool. Surv. India*, 64(1-4), p.132, 1970 (R. Ken, Banda dist., U.P.).- Jayaram, *Handbk. FW. Fish. India*, p.103 (distribution), p.109 (key), 1981.- Jayaram, *et al.*, *Occ. Paper zool. Surv. India*, No. 36, p.64, 1982 (key, Cauvery river, S. India, variations).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.38, 1984 (Common and Vernacular names.)

Puntius punctatus Day, *Proc. zool. Soc. Lond.*, p.302, 1865.

Barbus punctatus Day, *Fish. India*, p.577, pl.144, fig.5, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.326, 1889.- Hora, Misra & Malik, *Rec. Indian Mus.*, 41, p.272, 1939 (considered synonymous with *ticto*).- Hora & Law, *Rec. Indian Mus.*, 43, p.248, 1941 (specimens with complete lateral line treated as synonymous with *ticto*).- Hora, *Rec. Indian Mus.*, 44, p.195, 1942 (considered synonymous with *ticto*). - Venkateswarlu & Rama Rao, *Occ. Paper zool. Surv. India*, No.87, p.13, 1986 (synonym of *P. ticto*).

Barbus (Puntius) punctatus, Hora, Misra & Malik, *Rec. Indian Mus.*, 41, p.271, 1939 (variations discussed).

Puntius ticto punctatus, Jayaram, *Handbk. FW. fish. India*. p.103, (distribution), p.109 (key), 1981.

Barbus mccllellandi (nec. C & V), Day, *Proc Zool. Soc. India*, p.619, 1869 (type locality, Pegu, Burma).

Barbus (Puntius) stoliczkanus Day, *J. Asiat. Soc. Beng.*, p.328, 1871.- Day, *Fish. India*, p.577, pl.144, fig.8, 1878.- Day, *Fauna Brit. India Fish.* 1, p.326 1889.- Hora, *Rec. Indian Mus.*, 39, p.330, fig.5, 1937 (Sandoway, Burma; difference from *ticto ticto* discussed).

Barbus mccllellandi Day, *Proc. zool. Soc. Lond.*, p.619, 1869 (nec. Valenciennes).- Annandale, *Rec. Indian Mus.*, 16, p.283, 1919.- Hora, Misra & Malik, *Rec. Indian Mus.*, 41(3), p.266, 1939 (name only, affinities discussed).- Menon & Yazdani, *Rec. zool. Surv India*, 61(1 & 2), p.105, 1968 (syntypes in ZSI).

Barbus stoliczkanus, Annandale, *Rec. Indian Mus.*, 14, p.35, 1918 (Fort Stedman, Inle Lake, Shan States, Burma).- Chaudhuri, *Rec. Indian Mus.*, 16, p.283, 1919 (Tanja, Burma).- Hora, *Rec. Indian Mus.*, 44, p.195, 1942 (Considered as synonym of *P. ticto*).- Venkateswarlu & Rama Rao, *Occ. Paper Zool. Surv. India*, No.87, p.19, 1986 (synonym of *P. ticto*).

Puntius ticto stoliczkanus, Jayaram, *Handbk. FW. fish. India*, p.103 (distribution), p.109 (key), 1981.

Vernacular Names : *Kah-nee potiah*, Putthi, Ass; *Tita punti*, Beng; *Kaoli*, *Kotree*, *Sidhari*, Hind; *Kadum kali*, Mal; *Kudgi kerrundi*, Ori; *Manimajra*, *Kali Bein*, *Ticher*, *Chidhu*, Punj, *Wennattee*, *Pulli Kendai*, Tam; *Parigi*, Tel.

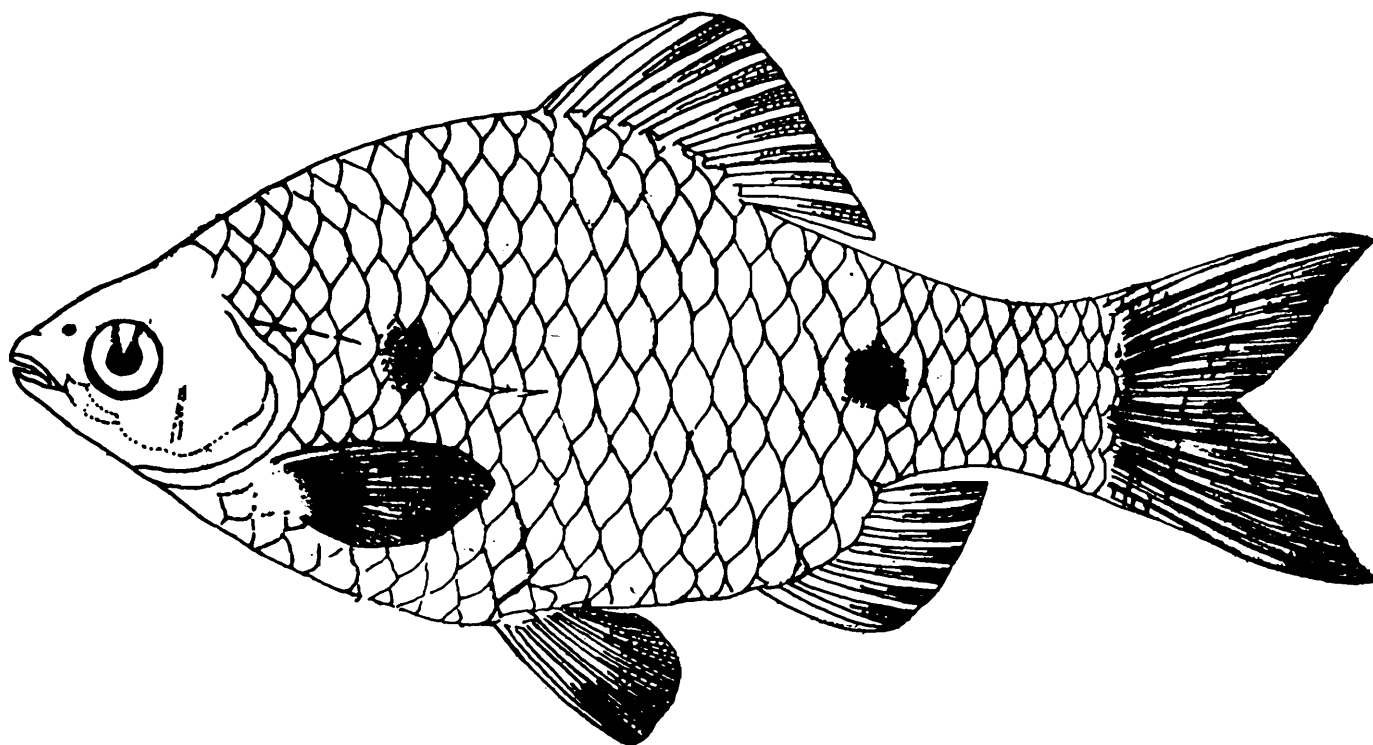
Specimens Studied : ZSI, SRS, Unreg. 168 exs., 33 to 127.5 mm SL, from different localities in the Cauvery River System, KCJ Coll.1973,1974,1977. ZSI, F.12479/1, Sandoway, Burma, (*P. stoliczkanus*). ZSI, SRS, Unreg. 1 ex., 48 mm SL, Loktak Lake, Manipur, KCJ Coll., Jan.1986. ZSI. F. 2127/2, 1 ex; Tejpur, Assam, 27.0 mm SL; S.L. Hora Coll.ZSI. F.12166/1, 1 ex; 36.00 mm SL; Nandoor river, U.P., E.O. Shebbeare Coll.

Diagnosis : A deep bodied small fish, with no barbels, dorsal ray short, osseous, serrated, lateral line complete or incomplete. A black blotch on 3rd, 4th or 5th lateral line scale and another more conspicuous one between 16th to 20th scales invariably present.

Description : D.III-IV, 8; P. 13 to 15; V.i,8; A.iii, 5; C.19; LL.21-26.

Dorsal profile steep, with a distinct rise from occiput, ventral profile uniformly arched. Head short, conical. Head length 23.25 to 34.60 (27.78 to 30.30 common); body depth 27.02 to 43.48 (38.46 to 41.67 common) in percent of standard length. Head width 40.00 to 60.24, height of head at occiput 66.67 to 97.08, snout 45.00 to 33.34 in percent of head length. Snout plain, obtuse. Eyes large, superior, 16.67 to 35.00 in percent of head length, 62.50 to

100.00 in percent of interorbital width, 50.00 to 83.33 of snout length. Mouth terminal, its width equal to or less than inter-nostril distance. Lips thin, plain. No barbels.



Lateral view of *P. ticto*

Dorsal fin inserted slightly behind pelvic origin nearer caudal base than tip of snout. Last unbranched dorsal ray osseous, posterior margin serrated with 12 to 18 teeth. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 50.00 to 90.09 in percent of its length. Lateral line may be complete or incomplete.

Scales : PDS 8 to 11 (9 to 11 common); Pre-anal 11 to 14;

Pre-pelvic 5 to 7

Between LL and dorsal fin base $4\frac{1}{2}$ to $5\frac{1}{2}$

Between LL and Pelvic fin base 3 to $4\frac{1}{2}$

Between LL and anal fin base $3\frac{1}{2}$ to $4\frac{1}{2}$

Circumpeduncular 10 to 12

Gill Rakers : 2 to 4 + 5 to 7

Size : 100 mm TL

Colour : Varies with age and sex besides habitat. Juveniles below 30 mm tend to have a black mark at the commencement of dorsal fin. Two black blotches are present along the lateral line, the first extending over 3rd or 4th or 5th scale disappears when the fish grows

about 60 mm length. The second one above the anal fin over 16th to 20th scale, covering only 2 or 3 scales invariably remains.

Body light to dark brown on dorsal and upper half of sides, rest of body light brown, Fresh specimens may be silvery with dark pigment dots above and upper half of lateral line.

Distribution : Widely distributed in India, Pakistan, Sri Lanka, Bangladesh, Burma, Thailand.

Relationships : Distantly related to *P. chola* differing from it in having a larger and more anterior caudal spot over the anal fin besides another above pectoral fin, lateral line incomplete, and having no barbels.

Additional Data :

TL/Head length	16.92 to 24.32	N=19
TL/Body depth	27.55 to 37.30	N=19
SL/Pre dorsal	52.08 to 66.67	N=22
SL/Pre anal	70.37 to 78.38	N=22
SL/Pre pelvic	46.38 to 55.56	N=22
LH/LCPD	55.56 to 88.89	N=22
LH/HCPD	55.33 to 100.00	N=21
LH/Dorsal fin base	60.00 to 90.91	N=21
LH/Width of mouth	13.33 to 27.27	N=22

Remarks : This species is a highly variable one showing variations in its major characters as lateral line scale count, lateral line, dorsal spine and colouration, besides body proportions. Several attempts have been made to segregate some of the populations as subspecies. Hora (1937) tried to separate *P. stoliczkanus* from *ticto* but the characters were found not of much use. Specimens of *ticto* from Peninsular India were found to exhibit gradations between *punctatus* and *stoliczkanus*. Hora, Misra & Malik (1937) ably demonstrated the variations in *P. ticto* and treated *punctatus* and *stoliczkanus* as synonyms. Silas (1952) however distinguished *ticto*, *punctatus* and *stoliczkanus* as subspecies of *ticto* based on the data of Hora *et al.* (1937) such as

(a) lateral line being complete or incomplete.

(b) differences in the number of pectoral fin rays, lateral line scales, pre-dorsal scales and scales between lateral line and pelvic fin base.

It is well known that *P. ticto* with or without complete lateral line is not restricted to any definite geographic region or zone. Murty (1977), Mirza & Abdussamad (1982) did not agree with Silas' views. There are no definite evidences for treating *punctatus* and *stoliczkanus* as separate subspecies.

Puntius conchoni* (Hamilton)*“Rosy Barb”**

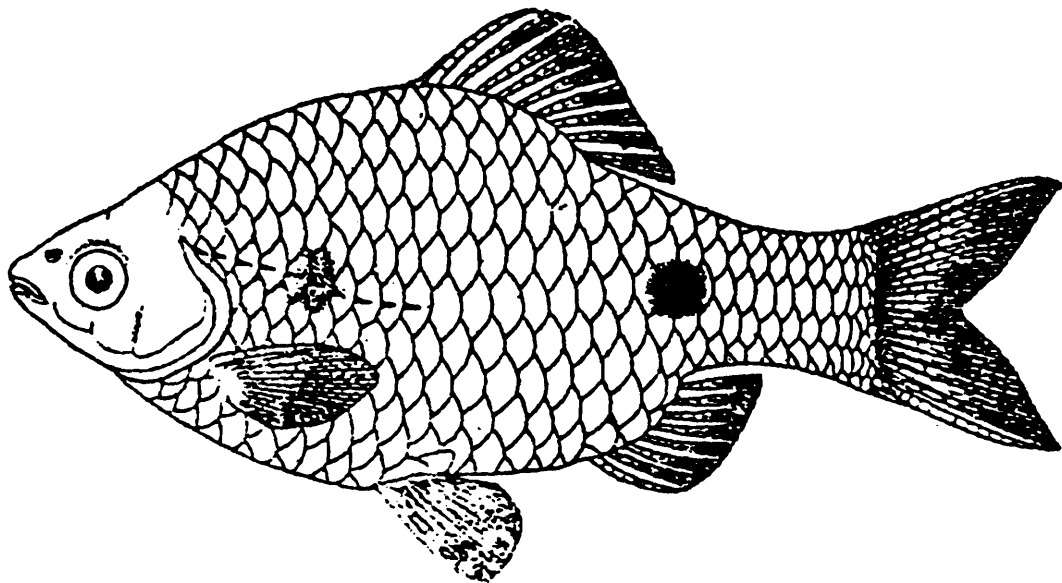
- Cyprinus conchoni* Hamilton, *Fish. Ganges*, pp.317,389,1822 (type locality, North-East Bengal and rivers Kosi and Ami).- Valenciennes, *Hist. Nat. Poiss.*, 16, p.394, 1842.
- Systemus conchoni*, McClelland, *Asiat. Res.*, 19, pp.285, 286, 384, pl.44, fig.8, 1839.-Bleeker, *Verh. Bat. Gen.*, 25, p.60, 1853.
- Systemus pyrropterus* McClelland, *Asiat. Res.*, 19,p.383, pl.44,fig. 1, 1839 (type locality, Upper Assam).- Bleeker, *Verh. Bat. Gen.*, 25, p.62, 1853.
- Barbus pyrropterus*, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.157, 1868.
- Barbus conchoni* Gunther, *Cat. Fish. Brit. Mus.*, 7, p.153, 1868.-Day, *Fish. India*, p.576, pl.143, fig.7, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.325, 1889.- Jenins, *Rec. Indian Mus.*, 3, p.288, 1909.- Shaw & Shebbeare, *J. Asiat. Soc. Beng.*, 3, p.36, pl.5, fig.3, text.fig. 32, 1937 (clear streams below 2000 ft., N. Bengal).- Hora, Misra and Malik, *Rec.Indian Mus.*, 41, pl.3, p.273,1939 (revision).-Hora, *Rec. Indian Mus.*, 22 (3), p.166, 167,174,186,1921.- Hora, *Rec. Indian Mus.*, 22, p.743, 1921 (foothills below Darjeeling).- Hora & Mukerji, *Rec. Indian Mus.*, 37, p.383, 1935 (Naga hills).-Hora, *Rec. Indian Mus.*, 39, p.339, 1937 (Nandhaur, Kalaunia rivers, Naini Tal).-Hora, Misra & Malik, *Rec. Indian Mus.*, 41, p.273, 1939 (relationship with *ticto* shown).- Das & Subla, *Ichthyologica*, 3(1 & 2), p.58, 1964 (Kashmir).
- Barbus (Puntius) conchoni*, Hora & Law, *Rec. Indian Mus.*, 43(2), p.237, 240, 1941 (name only, distribution).- Hora & Nair, *Rec. Indian Mus.*, 43, p.367 (Harda, Hoshangabad, M.P.), 1941.-Hora & Gupta, *J. Asiat. Soc. Beng.*, 6, p.79,1940 (Kalimpong Duars, N. Bengal).- Menon, *Rec. Indian Mus.*, 47(2), p.229, 1949 (name only, Rivers Purana and Naya Pataya, Hoshiarpur dist., E. Punjab).- Job, David & Das, *Indian J. Fish.*, 2 (1), p.32, 1955 (Mahanadi below Hirakud dam).
- Puntius conchoni*, Chauhan & Ramakrishna, *Rec. Indian Mus.*, 51, p.404,1953 (Tel river, Balangir dist., Orissa).- Menon, *Rec. Indian Mus.*, 52(1),p.22, 1956 (Manipur).- Motwani & David, *J.zool. Soc. India*, 9(1), p.11,1957 (Sone river, Bihar).- Dutta Gupta *et al.*, *Proc Rajasthan Acad. Sci.*, 8(1 & 2), 1961 (Lakes in Jaipur, Udaipur and Jhunjhunu districts, Rajasthan).- Motwani *et al.*; *Trop. Ecol.* 3(1 & 2), p.20,1962 (R.Brahmaputra, Assam).- Misra, *Rec. Indian Mus.*, 57(1-4), p.152, text. fig. 76,1962 (brief description).- Karamchandani, *Tropical Ecology*, 3(1 & 2), p.80,1962 (R.Ganga at Dighwara, Bihar).- Pant, *Rec. zool. Surv. India*, 64(1-4),p.87, 1970 (Almora).- Sen *et al.*, *Seafood Export J.*,11(1),p.3, 1970 (local name, Calcutta).- Menon *et al.*, *Sci & Cult.* 38,p.341,1972 (Hooghly river, Pulta stretch).- Venkateswarlu, *Indian J. Zootomy*, 13(3), p.122, 1972 (name only, Bihar).- Venkateswarlu & Rama Rao, *Seafood Export J.*, 5(6)p.3, 1973 (vernacular names in Gangetic delta).-Mirza, *Biologia*, 20(1), p.78, 1974 (name only, Indus plain and adjoining hills).-Rahman, *Bangladesh J. Sci. Indus. Res.*, 9(3 & 4), p.201 (name only, Bangladesh, Bengali name), p.154 (key for identification) 1974.- Rahman, *Bull. Fw. fish. Res. Stn. Chandpur. No.1*, p.8, 1974 (name only, checklist, Bangladesh).- Menon, *Spl. Publ. No.1, Int. Fish. Soc. India*, p.38, 1974 (checklist of Himalayan and Indo-gangetic plain fishes).- Mirza, *Bijdr. Dierk.*, 45(2), p.172, 175 (Indus plain).- Venkateswarlu, *Acta Ichthyol. Piscatoria*, 6(1), p.92, 1976 (R. Ganga, Poonpun, Sone, Gandak near Patna).- Venkateswarlu, *Acta Ichthyol. Piscatoria*, 7(1), p.49, 1977 (R. Poonpun, Bihar). Jayarams Singh, *Retc, Zool. Sur. India*, 72, p.252, 1977 (Rivers Teesta, Mahananda and Dharala, N. Bengal). Sadiq & Mirza, *Pakistan J. Zool.*, 10(2), p.299, 1978 (Head Tounsa, Multan dist., Pakistan).-Sen, *Seafood Export J.*, 10(1), p.2, 1978 (Assam, local & English names).-Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*, 9(1), p.52, 1979 (name only, list of Ganga fishes).-Srivastava, *Fishes of U.P. & Bihar*, p.62, fig. 43, 1980.- Mirza, *Proc. Ist. Pakistan Congr. Zool.*, p.16, 1980 (checklist, distribution in Pakistan and Azad Kashmir).- Jayaram, *Handbk. FW. Fish. India*, p.100 (distribution), p.109 (key), 1981. Jayaram *at al.*, *Occ. Paper zool. Surv. India*, No. 36, p.54, fig. 10, 1982 (key, Cauvery river, S. India, record from Cauvery).- Mirza & Abdussamad, *Biologia*, 28, (1), p.77, 1982 (description, Pakistan).- Husain & Tilak, *Rec. zool. Surv. India*, 81 p.274, 1984 (name only, Faizabad dist., U.P.).-Venkateswarlu, *Occ. Paper zool. Surv. India*, No. 56, p.36, 1984 (common & vernacular names).- Sen, *Occ. Paper zool. Surv. India*, No.64, p.81, 1985 (Assam).- Lipton, *Matsya*, 9 & 10, p.11, 1985 (Tripura).
- Puntius conchoni khagariensis* Srivastava & Munshi, *Natural History & Syst. Fw. Fishes*, p.179 (key), p.186 (Key), 1988 (type locality, Khagaria district, Bihar).

Vernacular Names : *Putthi*, Ass; *Kanchonpungti*; *Kunchon pungti*, Beng; *Punti Sidhari*, Hind; *Pitia kerundi*, Ori; *Ticker Chidu*, Punj.

Specimens Studied : ZSI, SRS, unreg. 300 exs., 26.5 to 64.5 mm SL., from different localities in the Cauvery river system, KCJ Coll. 1973, 1974, 1977. ZSI F.1940/2, 3 exs., 79.00 to 85.00 mm SL., Old settling tank No. 4, Pulta Water Works, W.Bengal, M. N. Datta Coll. ZSI, F. 2060/2, 1 ex., 83 mm SL., Pulta water works, Barrackpore, W.Bengal, Pulta Survey, 22.7, 1938, ZSI, F.3224/1, 2 exs., 56.00 & 65.00 mm. SL., Nainital, U.P., Mus. Coll.

Diagnosis : A deep bodied short fish without any bands, no barbels, dorsal ray osseous, short, serrated and lateral line incomplete with 24 or 26 scales. A large black spot above anal fin with dorsal fin tipped black.

Description : D.III, 8; P.11; V.i, 8; A. ii, 5; C.19; LL. 24-26.



Lateral view of *P. conchoniis*

Dorsal and ventral profiles arched. Head moderate sized, bluntly pointed. Head length 24.61 to 40.00 (mostly 26.53 to 29.31) in percent of standard length, body depth 33.93 to 47.06 (mostly 36.36 to 45.28) in percent of standard length. Head width 32.94 to 64.10, height of head at occiput 76.92 to 100.00 in percent of head length. Snout bluntly pointed, plain, 25.00 to 37.50 in percent of head length. Eyes small to moderate, 20.00 to 34.78 in percent of head length, 50.00 to 88.89 in percent of interorbital width and 71.43 to 114.29 of snout length. Mouth antero-superior, width of gape of mouth greater than inter-nostril distance. Lips thick, upper lip reflected a bit forward. No barbels.

Dorsal fin inserted equidistant between tip of snout and caudal fin base. Last unbranched dorsal ray ossified, strong and serrated. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins do not extend to pelvic fins; latter nearly reaching anal opening. Anal fin when laid flat mostly reaching root of caudal fin. Least depth of caudal peduncle 50.00 to 89.28 in percent of its length. Lateral line incomplete, ceasing after 9 to 10 scales.

Scales : PDS 9-11; Pre-anal 16 to 18; Pre-pelvic 6 to 8.

Between LL and dorsal fin base	5 $\frac{1}{2}$
Between LL and pelvic fin base	3 $\frac{1}{2}$ to 4 $\frac{1}{2}$
Between LL and anal fin base	3 $\frac{1}{2}$ to 4 $\frac{1}{2}$
Circumpeduncular	10 or 11

Gill Rakers : 1-3 + 8-10

Size : 120 mm TL.

Colour : In spirit preserved specimens yellowish brown on dorsal and lateral sides. Yellowish white ventrally. A large black spot on lateral line just above anal fin. Fins yellowish, occasionally dorsal fin tipped black; opercles lake colour. Fins orange, dorsal with its upper half blackish. In life the fish is golden violet in colour below the lateral line with the opercle shot with red. Generally each scale has a black tinge or a small spot. The black spot on the lateral line varies in position from 8th to 19th scale.

Distribution INDIA: J&K., U.P., Bihar, M.P., Rajasthan, Assam, West Tripura, Bengal, Nagaland, Manipur, Orissa, S. India. Pakistan, Bangladesh.

Relationships Close to *P. ticto ticto* (Ham) differing from it in having a deeper body, more number of lateral line scales (24 to 28 vs 22-26) and absence of an anterior colour spot.

Remarks Jayaram *et al.*, (1982) pointed out for the first time the occurrence of this species in large numbers in the Cauvery watershed. Prior to this, the species was known only upto Orissa. Hora (1942), Checko *et al.* (1954) did not include this species in their list of Cauvery fishes, evidently for want of material. It is more abundant in the hills than in the plains. Hora, Misra & Malik, (1939) considered this species as a doubtful synonym of *ticto* with which it is closely related.

Munshi & Srivastava (1988) in their book on the "Freshwater Fishes of India" mention *Puntius conchoniis khagariansis* as a new subspecies of *P. conchoniis* No description is given nor seem to have been published. No type has been designated. The subspecies is differentiated from the nominal form by its having a complete lateral line. Hora, Misra & Malik (1939) have clearly demonstrated the variability of the lateral line extent in the *ticto* group of species. Under the circumstances this subspecies is synonymised.

Additional Data

TL/Head length	19.89 to 23.75	N=14
TL/Body depth	27.54 to 37.33	N=14
SL/Pre dorsal	47.69 to 60.34	N=16
SL/Pre anal	69.41 to 77.17	N=16
SL/Pre pervic	47.69 to 58.20	N=16
LH/Mouth width	16.67 to 25.00	N=16
LH/LCPD	66.67 to 92.31	N=16
LH/HCPD	50.00 to 62.50	N=16
LH/Dorsal fin base	54.17 to 75.00	N=16

***Puntius shalynius* Yazdani & Talukdar**

Puntius shalynius Yazdani & Talukdar, *J. Bombay nat. Hist. Soc.*, 72(1), p.218, fig., 1975 (type locality, Barapani lake, Shillong, Meghalaya).- Yazdani, *J. Bombay nat. Hist. Soc.*, 74(1), p.20, 1976 (Khasi hills, Meghalaya, 1739 exs, 9 to 62 mm TL examined).- Jayaram, *Handbk. FW. Fish. India*, p.102 (distribution), p.109 (key), 1981.- Sen, *Occ. Papers zool. Surv. India*, No.64, p.83, 1985 (Assam).

Vernacular Names : *Shalyni*, Khasi & Jaintia.

Specimens Studied : ZSI, ERS 512 Barapani, 41.5 mm SL, S.K. Talukdar Coll. 11.2.72.

ZSI, ERS 513 Mawpat, 24 mm SL, G.M. Yazdani, Coll. 3.9.70.

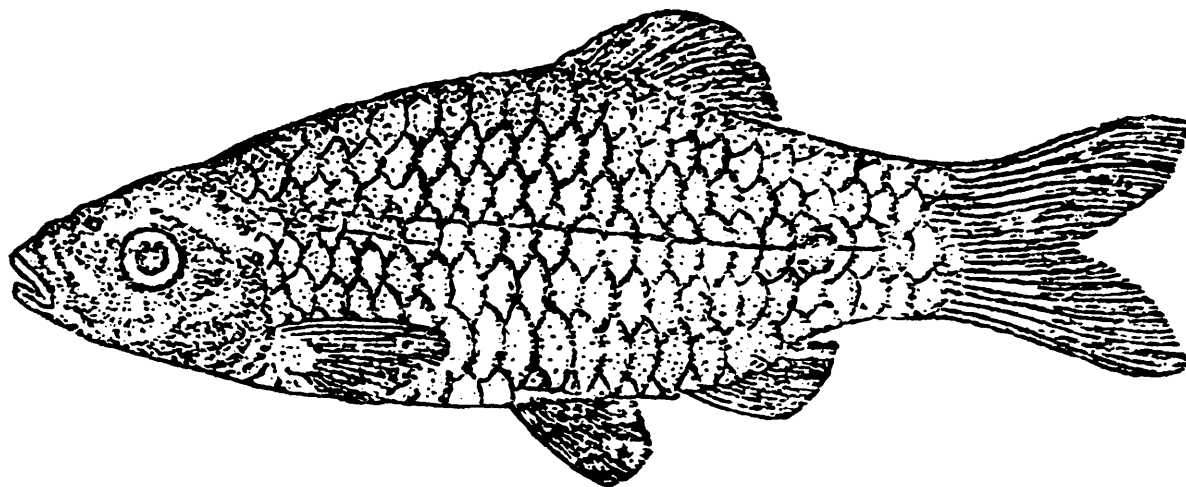
ZSI, ERS 514, Myllem, 47 mm SL, S.K. Chandra; Coll. 18.3.72.

ZSI, ERS 515, Jowai 25.5 and 27.0 mm SL, K. Reddiah Coll. 18.12.60.

Diagnosis : A small deep bodied species without barbels. Last unbranched dorsal ray ossified serrated, lateral line incomplete (ceasing after 6 or 7 row of scales, a horizontal blue streak on body and two dark spots on caudal base.

Description : D. II-III, 7-8; P.13-15; V.i, 7-8; A.i-ii, 5; C.15-17; LL. 20-23.

Dorsal profile a little more convex than ventral. Head short, obtuse. Head length 26.00 to 34.10; body depth 28.60 to 37.80 in percent of standard length. Head width 56.00 to 62.50; height of head at occiput 73.30 to 84.60; snout 25.00 to 30.80 in percent of head length. Snout blunt, plain. Eyes large, superior, 25.00 33.30 in percent of head length, 70.00 to 100.00 in percent of interorbital width and 26.67 to 37.50 snout length. Mouth terminal, its width less than inter-nostril distance. Lips thin. No barbels.



Lateral view of *P. shalynius*

Dorsal fin inserted nearer caudal base than tip of snout. Last unbranched dorsal ray osseous, serrated with 8 to 10 teeth on its inner edge. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvics; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 61.53 to 88.88 percent of its length. Lateral line incomplete, ceasing after 10 or 11th scale, but variable in some, ceasing after 4th scale itself.

Scales : PDS 9 to 11; Pre-anal 12 to 14; Pre-pelvic 7 or 8

Between LL and dorsal fin base	3 $\frac{1}{2}$ to 4 $\frac{1}{2}$
Between LL and pelvic fin base	2 $\frac{1}{2}$ to 3 $\frac{1}{2}$
Between LL and anal fin base	2 $\frac{1}{2}$ to 3 $\frac{1}{2}$
Circumpeduncular	9 or 10

Gill Rakers : 2 or 3 + 10 to 12

Size : Maximum 62 mm TL

Colour : Variable. Females yellow to black on sides and back, silvery below; scales black edged. Fins mostly orange with light blackish tinge. Males more black in appearance, fins except caudal, jet black. two spots on either side of tail in both sexes, anterior one situated nearly opposite end of anal more distinct than the posterior situated near the caudal. A blue horizontal line along middle of body and minute black spots on head.

Distribution INDIA Khasi Hills, Meghalaya, Assam.

Relationship Close to *P. ticto ticto* differing from it in colouration and scale counts.

Additional Data

TL/Head length	21.74 to 22.73	N=5
TL/Body depth	24.24 to 30.18	N=5
SL/Pre dorsal	50.00 to 53.70	N=5
SL/Pre anal	62.50 to 71.28	N=5
SL/Pre pelvic	45.09 to 51.06	N=5
LH/Mouth width	21.74 to 26.67	N=5
LH/LCPD	69.23 to 86.96	N=5
LH/HCPD	46.67 to 61.53	N=5
LH/Dorsal fin base	56.00 to 62.50	N=5

Remarks : Holotype. Male 58.00 mm TL. ERS/ZSI 511, Shillong, Barapani Lake, Shillong, Khasi Hills, Meghalaya.

This species has not been recorded subsequent to its first description.

The “guganio” group

Species :

P. guganio (Hamilton), 1822, p.338

P. punjabensis (Day), 1871, p.334

P. nangalensis Jayaram, 1990

P. apogon (Val), 1842, p.392

Common Characters :

1. No barbels.
2. LL scales 31 to 43
3. PDS 12 to 15
4. Dorsal fin base equal to or greater than least depth of caudal peducle.
5. Restricted distribution.

***Puntius guganio* (Hamilton)**

Cyprinus guganio Hamilton, *Fish. Ganges*, pp.338, 339, 392, 1822 (type locality, the Brahmaputra and the Yamuna).

Leuciscus guganio, Valenciennes, *Hist. Nat. Poiss.*, 16, p.445, 1842.-Bleeker, *Verh. Bat. Gen.*, 25, p.68, 1853.

Barbus guganio, Day, *Fish. India*, p.579, text. fig. (Hamilton's MS drawing), 1878.-Day, *Fauna Brit. India Fish.*, 1, p.328, 1889.-Das, *Rec. Indian Mus.*, 41, p.442, TF.3, 1939 (Hazaribagh dist., Bihar, specific status discussed).

Barbus (Puntius) guganio, Hora, *Rec. Indian Mus.*, 42, p.372, 1940 (Mahanadi near Sihawa, M.P.).- Hora, *Rec. Indian Mus.* 43, p.367 (Harda, M.P.) 1941.

Barbus ambassis Day, *Proc. zool. Soc. Lond.*, p.583, 1868 (type locality, Madras).-Day, *Fish. India*, p.576, pl.145, fig.1, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.324, 1889.-Das, *Rec. Indian Mus.*, 41, p.442, text. fig.2, 1939 (considered synonym of *B. guganio*).- Hora, *Rec. Indian Mus.*, 42, p.372, 1940 (synonymy with *guganio* confirmed, Raipur dist., M.P.).- Jayaram & Singh, *Rec. zool. surv. India*, 72, p.251, 1972 (Rivers Teesta, Balasan, N. Bengal).- Ventateswarlu & Rama Rao, *Occ. Paper zool. Surv. India*, No.87, p.73, 1986 (synonym of *P. guganio*).

Puntius ambassis, Venkateswarlu, *Indian J. Zootomy*, 13(3), p.122, 1972 (name only, Bihar).- Rahman, *Bangladesh J. Sci. & Indus. Res.*, 9(3 & 4), p.201 (name only, Bangladesh, Bengali name), p.154. (key for identification), 1974.- Rahman, *Bull. FW. Fish. Res. Stn. Chandpur*, No. 1, p.8, 1974 (name only, checklist, Bangladesh).

Puntius guganio, Venkateswarlu, *Indian J. Zootomy*, 13(3), p.122, 1972 (name only, Bihar).- Sen, *Seafood Export J.*, 10(1), p.3 1978 (Assam, local English names).-Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*. 9(1), p.52, 1979 (name only, list of Ganga fishes).

Barbus (Puntius) guganio, Job, David & Das, *Indian J. Fish.*, 2, (1), p.32, 1955 (Mahanadi below Hirakud dam).

Puntius guganio, Menon, *Spl. Publ. No.1, Int. Fish. Soc. India*, p.39, 1974 (checklist of Himalayan & Indo Gangetic fishes).- Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*, 9(1), p.52, 1979 (name only, list of Ganga fishes).- Jayaram, *Handbk. FW. Fish. India*, p.101 (distribution), p.108 (key), 1981.-Venkateswarlu, *Occ. Paper zool. Surv. India*, No. 56, p.37, 1984 (Common & Vernacular names).- Sen. *Occ. Paper zool. Surv. India*, No. 64, p.79, 1985 (Assam).

Vernacular Names : *Putthi*, Ass; *Gugani*, Beng.

Specimens Studied : ZSI, F.13064/1. 1 ex., 25.0 mm SL, biweekly market at Sihawa, Hoshangabad dist., Madhya Pradesh, H.S. Rao coll. 13.12.39. ZSI, F.13290/1., 2 exs., 21 & 25.00 mm SL, Barakar river, Hazaribagh dist., Bihar.

Diagnosis : An elongated fish without any bands, no barbels, dorsal ray strong, osseous, serrated, lateral line incomplete ceasing after 5 or 6 scales. Body diaphnous with a small black spot at caudal base.

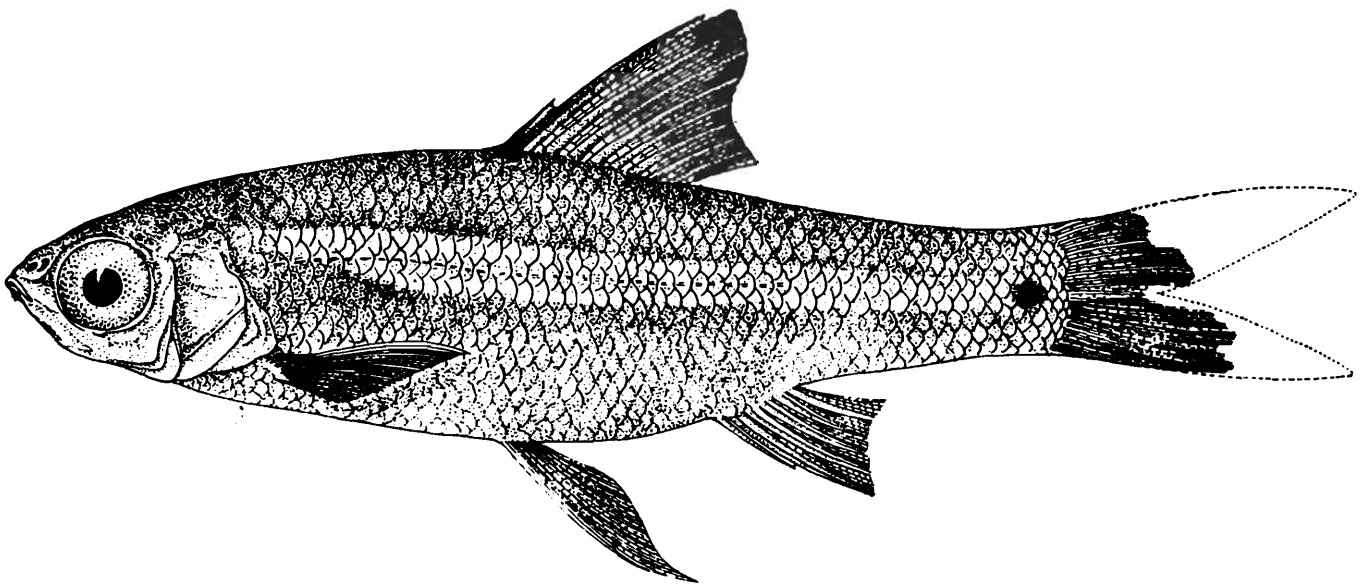
Distribution : D. III. 8; p.11; V.i, 8; A.i-ii, 5; C.19; LL. 36-39.

TABLE 2
Comparison of the species of the "guganio" group

Characters	<i>Puntius guganio</i> (Ham), 1822, p.338	<i>Puntius punjabensis</i> (Day), 1871, p.334	<i>Puntius nangalensis</i> Jayaram, 1990	<i>Puntius apogon</i> (Val.), 1842, p.392
1. No. of barbels	NIL	NIL	NIL	NIL
2. Last unbranched dorsal ray	Ossified, serrated	Weak, articulated	Ossified, serrated	Osseous, strong, serrated
3. Lateral line	Incomplete after 5 or 6 scales	Incomplete	Incomplete after or 8 scales	Complete
4. LL Scales	36-39	43	41 to 33	36 to 38
5. PDS	15	14	12 or 13	12 to 15
6. LL/Dorsal	8-9	8	5 to 5 ¹ / ₂	6 ¹ / ₂ to 7 ¹ / ₂
7. LL/Pelvic	5 ¹ / ₂ to 6	? 4 ¹ / ₂	5 ¹ / ₂ to 6	5 to 5 ¹ / ₂
8. LL/Anal	6	? 3 ¹ / ₂	3 ¹ / ₂ to 4 ¹ / ₂	5 ¹ / ₂
9. Circumpeduncular	10	? 9 or 10	12 or 13	13 or 14
10. Prepelvic	9	? 12	6 to 8	6 to 8
11. Preanal	21	25	12 to 14	21
12. Gill Rakers	0 + 9	-	5 to 12	5 + 8
13. SL/LH	2.86 or 5.50	3.50	3.14 to 4.19	3.63 to 3.76
14. SL/BD	2.86 to 3.50	3.50	3.12 to 3.69	2.44 to 2.61
15. LH/Eye	3.00 to 3.50	5.33	2.00 to 4.00	3.50 to 4.12
16. LH/Snout	3.00 to 3.50	4.00	2.00 to 4.00	3.11 to 3.14
17. IOW/Eye	0.90 to 1.00	1.33	0.80 to 1.25	1.00 to 1.25
18. Snout/Eye	1.0	1.33	0.80 to 1.50	0.76 to 0.88
19. LCPD/HCPD	1.25 to 1.67	1.33	1.25 to 1.83	1.06 to 1.17
20. Mouth Width/IND	Less than	Greater than	Greater than	Less than
21. Dorsal fin base	= or greater than HCPD	= HCPD	Greater than HCPD	Greater than HCCPD
22. Colour	No spot. A white streak	One spot on caudal base	No spot. A longitudinal band	No spots
23. Distribution	Restricted	Restricted	E. Punjab	Burma to Malay Archipelago

Dorsal profile less steep than ventral. Head short, blunt. Head length 18.18 to 35.00, body depth 28.57 to 35.00 in percent of standard length. Head width 42.85 to 50.00, height of head at occiput 71.42 to 83.34, snout 28.57 to 33.33 in percent of head length. Snout blunt, plain. Eyes large, visible from below ventral surface, 28.57 to 33.33 in percent of head length, 100.00 to 111.00 in percent of interorbital width and 100.00 of snout length. Mouth at the end of snout, its width less than inter-nostril distance. Lips thin, plain. No barbels.

Dorsal fin inserted midway between tip of snout and base of caudal fin. Last unbranched dorsal ray strong, osseous, serrated with about 15 teeth. Dorsal fin base equal to or greater than least depth of caudal peduncle. Pectoral fins long not extending to pelvic fins; latter long, in turn reaching anal opening. Anal fin when laid flat not reaching root of caudal fin base. Least depth of caudal peduncle 60.00 to 80.00 in percent of its length. Lateral line incomplete ceasing after 5 or 6 scales.



Lateral view of *P. guganio*

Scales : PDS 15; Pre-pelvic 9; Pre-anal 21

Between LL and dorsal fin base	8-9
Between LL and pelvic fin base	5 $\frac{1}{2}$ -6
Between LL and anal fin base	6
Circumpeduncular	10

Gill Rakers : 0 + 9

Size : 70 mm TL

Colour : Olive green with a white streak along mid body.

Distribution : INDIA: Ganga, Brahmaputra, Yamuna river systems in Gangetic provinces and Assam. Also Madras, Madhya Pradesh, Orissa and W. Bengal. Bangladesh.

Relationship : Related to *ticto* group, close to *P. ticto* differing from it in having greater number of lateral line scales and colouration.

Remarks : Day (1878) did not give any illustration of this species in his *Fish. India*. In 1889 he quoted Hamilton's description and stated that *guganio* is "evidently allied to *Barbus ambassis*". Both species share the same colour pattern, although *ambassis* is more prevalent in south India. Hora (1937) stated that "*B. guganio* is known only from Hamilton's original description and figure and so far as I am aware no specimens of this species is at present available in any Museum collection" Das (1939) having examined nine examples from Barakar river, Hazaribagh district, Bihar and also a few specimens collected by Hora from Maltipur on the Hooghly river and provisionally referred by Hora to *B. ambassis* elucidated the systematic position. Das opined that in the specimens examined by him a few agreed with Hamilton's original description of *guganio* whilst a few in their general facies, proportions, and colouration agreed with Day's description of *ambassis*. These specimens have the dorsal spine black throughout their length and also have a black spot at the base of the anterior rays of the anal fin. From these colour variations Das concluded that both Hamilton and Day had half-grown or adult specimens of the species and he merged *ambassis* with *guganio*. However, Hora (1940) having examined 22 examples of *guganio* ranging in size from 19-34 mm from Raipur dist., was not able to confirm Das' treatment of *ambassis* as a synonym of *guganio*. The range of variations between the species intergrade and are not significant enough to warrant separation of *ambassis*.

Additional Data : (N=3)

SL/Predorsal	44.00 to 55.00
SL/Pre anal	60.00 to 65.00
SL/Pre pelvic	46.00 to 50.00
LH/LCPD	71.43 to 83.34
LH/HCPD	42.86 to 66.67
LH/Dorsal fin base	42.86 to 66.67
LH/Mouth width	16.66 N=1

Puntius punjabensis (Day)

Barbus punjabensis Day, *J. Asiat. Soc. Beng.* 40, pl.2, p.334, 1871 (type locality, Ravi river near Lahore).-Day, *Fish. India*, p.580, pl.145, fig.2, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.331, 1889.- Hora, *Rec. Indian Mus.*, 25, p.377, 383, 1923 (Salt Range, Punjab).- Pruthi, *Rec. Indian Mus.*, 35, p.103, 107, 1933 (Khewra gorge, Punjab, Pakistan, Ecology).

Puntius punjabensis, Mirza, *Biologia*, 18(2), p.168, 1972 (Zugmayer's 1913 record from Las Bela, Baluchistan quoted).- Venkateswarlu, *Indian J. Zootomy*, 13(3), p.122, 1972 (name only, Bihar).- Mirza, *Biologia*, 20(1), p.79, 1974 (name only, South and Southeast Baluchistan, Indus plain & adjoining hills).- Menon, *Spl. Publ. No.1, Int. Fish. Soc. India*, p.40, 1974 (checklist of Himalayan & Indo-Gangetic Fishes).- Mirza, *Bijdr. Dierk.*, 45(2), p.172, 1975 (Indus plain adjoining hills, S. Baluchistan).- Mirza, *Biologia*, 22(1), p.115, 1976 (name only, montane and submontane regions of Pakistan).- Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*, 9(1), p.52, 1979 (name only, list of Ganga fishes).- Mirza, *Proc. Ist. Pakistan Congr. Zool.*, p.17, 1980 (checklist, distribution in Pakistan & Azad Kashmir).- Jayaram, *Handbk. FW. Fish. India* p.102 (distribution), p.110 (key), 1981.- Butt & Mirza, *Biologia*, 27(2), p.155, 1981 (Peshawar Valley, NWFP, Pakistan).- Mirza

& Omer, *Biologia*, 30(1), p.81, 1984 (Key, rare in Baluchistan, Zugmayer's record from Las Bela quoted).

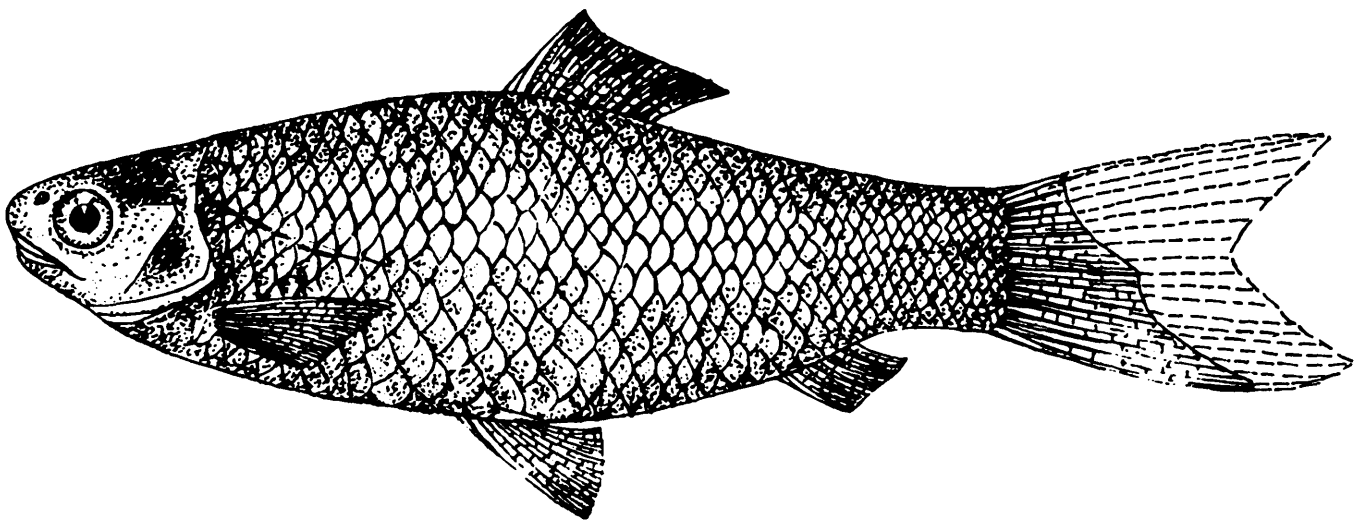
Vernacular Names : NIL

Specimen Studied : ZSI 2456, Holotype, 28 mm SL, Lahore purchased from Dr. F. Day (poorly preserved).

Diagnosis : An elongated fish without any bands or barbels, dorsal ray weak, non osseous, articulated and lateral line with 43 scales incomplete.

Description : D. III, 8, P.14; V.i, 8; A.ii, 5; C. 19; LL. 43.

Dorsal and ventral profiles moderately arched. Head short, bluntly rounded. Head length 28.57, body depth 28.57 in percent of standard length. Head with 31.25, height of head at occiput 75.00, snout 25.00 in percent of head length. Snout plain. Eyes rather large, in anterior half of head 18.75 in percent of head length, 75.00 in percent of interorbital width and 75.00 of snout length. Mouth terminal, slightly upturned, its width greater than inter-nostril distance. Lips thin, plain. No barbels.



Lateral view of *P. punjabensis*

Dorsal fin inserted midway between tip of snout and caudal base. Last unbranched dorsal ray weak, articulated. Dorsal fin base equal to least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 75.00 in percent of its length. Lateral line incomplete.

Scales *	PDS 14; Pre-anal 25; Pre-pelvic	12
	Between LL and dorsal fin base	8
	Between LL and pelvic fin base	4 $\frac{1}{2}$
	Between LL and anal fin base	3 $\frac{1}{2}$
	Circumpeduncular	9 or 10

* Counts as seen in figure *Fish India*, pl. 145, fig. 2, 1878.

Gill Rakers : Not taken.

Size : 50 mm TL

Colour : Silvery with a burnished silvery stripe along the side and a black spot at the caudal base. First two dorsal rays and intermediate membrane deep black.

Distribution : INDIA: Jabalpur, M.P., Bihar. PAKISTAN: Sind, Lahore, Baluchistan.

Relationship : Related to *P. guganio* differing from it in having the last dorsal ray weak and articulated (vs. osseous and serrated)

Remarks : It is unfortunate that all the original material "were spoiled" as stated by Day and that no further collections have been made of this species. Record from Jabalpur, M.P., Bihar, needs confirmation.

Additional Data :

SL/Pre dorsal	50.00
SL/Pre anal	75.00
SL/Pre pelvic	57.14
LH/LCPD	75.00
LH/HCPD	56.25
LH/Dorsal fin base	56.25
LH/Width of mouth	25.00

Puntius nangalensis Jayaram

Puntius nangalensis Jayaram, *J. Bombay nat. Hist. Soc.*, 86 (3 & 4), 1990. (type locality, Nangal Lake & Punjab)

Vernacular Names NIL

Specimens Studied ZSI, F.484^{1/2}, 1 ex., 27.5 mm SL, Holotype, Nangal lake, Punjab fisheries department (with a name label *Puntius mitrai* Menon). 1 ex., 24.0 mm SL Paratype, 9 exs., 22.0 to 28.0 mm SL, same data.

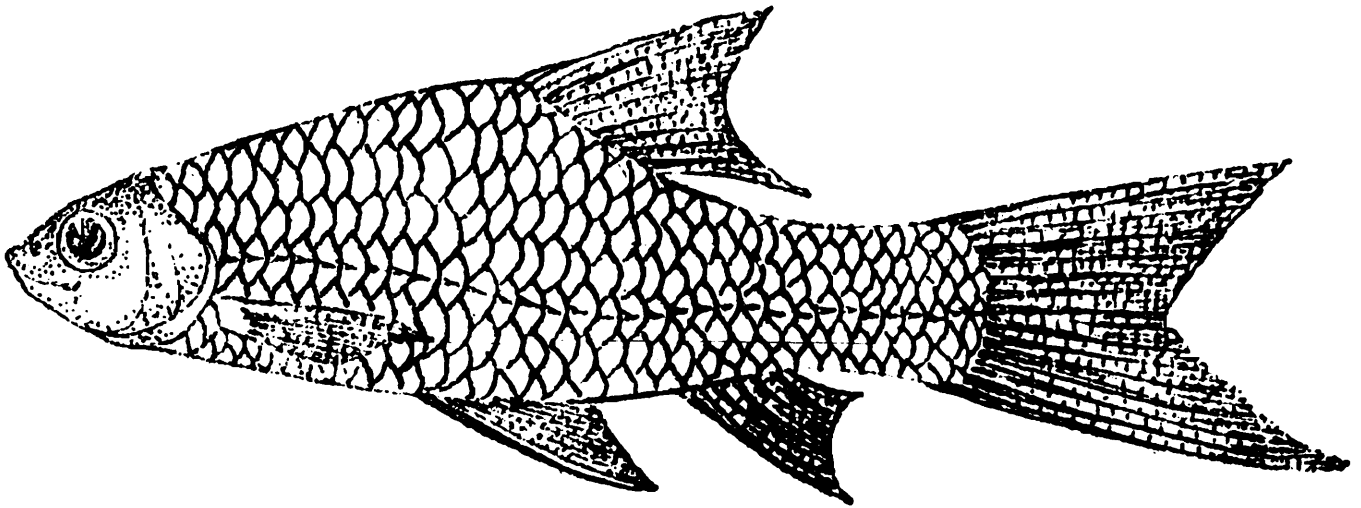
Diagnosis A deep bodied fish without any bands or blotches, with no barbels, dorsal ray osseous, serrated, lateral line incomplete ceasing after 7 or 8 scales and with 31 to 33 scales.

Description : D. I-II, 6-8; P. i, 12-13; V. i, 7-8; A.i-ii, 5; C.14-15; LL. 31-33.

Dorsal profile convex, with a good rise upto dorsal fin base. Head conical, head length 23.81 to 31.82, body depth 27.08 to 32.07 in percent of standard length. Head width 42.85 to 60.00, height of head at occiput 66.67 to 90.00, snout 25.00 to 50.00 in percent of head length. Eyes large, superior, 25.00 to 50.00 in percent of head length, 80.00 to 125.00 in percent of interorbital width and 66.67 to 125.00 of snout length. Mouth subterminal, its width greater than inter-norstril distance. Lips thin, plain. No barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray osseous, finely serrated, first branched dorsal ray elongated. Dorsal fin base greater than

least depth of caudal peduncle. Pectoral fins extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 54.54 to 80.00 in percent of its length. Lateral line in-complete ceasing after 7 or 8 scales from anterior.



Lateral view of *P. nangalensis*

Scales : PDS 12 or 13; Pre anal 12 to 14; Pre pelvic 6 to 8

Between LL and dorsal fin base	5 to 5 $\frac{1}{2}$
Between LL and pelvic fin base	5 $\frac{1}{2}$ to 6
Between LL and anal fin base	3 $\frac{1}{2}$ to 4 $\frac{1}{2}$
Circumpeduncular	12 or 13

Gill Rakers : 5 +12

Size : 37.0 mm TL

Colour : Uniformly brown all over, body diaphnous over pectoral area, each scale with a small black dot, a faint dark longitudinal streak along lateral line seen.

Distribution : INDIA : Nangal Lake, E. Punjab.

Relationship : Related to *P. guganio* differing from it in having a less deep body, larger eyes, less number of lateral line scales. Colouration (see Table 2) besides a more northern distribution.

Remarks : The material was found in the reserve type collections of ZSI, Calcutta with a name label *Puntius mitrai* Menon. I have searched the entire literature and find that this name is a nomen nudum. Hence it is described with a new name.

Additional Data :

TL/Head length	17.85 to 25.81	N = 10
TL/Body depth	21.43 to 27.42	N = 10

SL/Pre dorsal	45.83 to 57.77	N = 11
SL/Pre anal	59.09 to 70.83	N = 10
SL/Pre pelvic	37.77 to 50.00	N = 10
LH/LCPD	66.67 to 93.33	9
LH/HCPD	42.85 to 61.53	N = 11
LH/Dorsal fin base	50.00 to 66.67	N = 11
LH/Width of Mouth	25.00 to 33.33	N = 10

Puntius apogon (Valenciennes)

Barbus apogon Valenciennes, *Hist. Nat. Poiss.*, 16 p.392, 1842 (type locality, Java).-Gunther, *Cat. Fish. Brit. Mus.*, 7,p.150,1868.- Day, *Fish. India*, p.575, pl.141, fig.3, 1878.- Day, *Fauna Brit. India*, 1, p.324, 1889 (Tenasserim, throughout Burma as high as Mandalay to Malay Archipelago).- Hora, *Proc. nat. Inst. Sci. India*, 10(4), p.425, 1944 (common to Indian and Malayan region).

Systemus apogon, Bleeker, *Nat. Tijdschr. Ned. Ind.*, 3, p.428, 1852.

Systemus apogonoides Bleeker, *Nat. Tijdschr. Ned. Ind.* 9, p.410, 1855.

Cyclocheilichthys(*Anematischthys*)*apogon*, Bleeker, *Ichth. Arch. Ind. Prodr.*, 2, Cyprini, p.378, 1860.- Bleeker, *Atlas Ichthyol. Cyprin.*, 3, p.88, pl.29, fig.2, 1863.

Cyclocheilichthys(*Anematischthys*)*apogonoides*, Bleeker, *Ichth. Arch. Ind. Prodr. Cypr.*, 2, p.379, 1860.- Bleeker, *Atlas Ichthyol. Cyprin.*, 3, p.89, pl.30, fig.3, 1863.

Anematischthys apogon, Jordon & Seale, *Proc. U.S. Nat. Mus.*, 33,p.539, 1908.

Cyclocheilichthys apogon, Weber & Beaufort, *Fish. Indo-Austral. Archipel.*, 3, p.156, 1916.

Systemus macularis Blyth, *J. Asiat Soc. Beng.*, p.159, 1860.

Barbus macularis, Day, *Proc. zool. Soc. Lond.* p.557, 1869.

Barbus (*Cyclocheilichthys*) *apogon*, Shaw & Shebbeare, *J. Roy. Asiat. Soc. Bengal.*, 3(1), fig.30, p.34, 1937 (Terai-identity doubtful.)

Puntius apogon, Jayaram, *Handbk. FW. Fish. India*, p.99 (distribution), p.108, 1981.

Vernacular Names : *Nga-ta-zee*, *Nga-lay-toun*, Burmese.

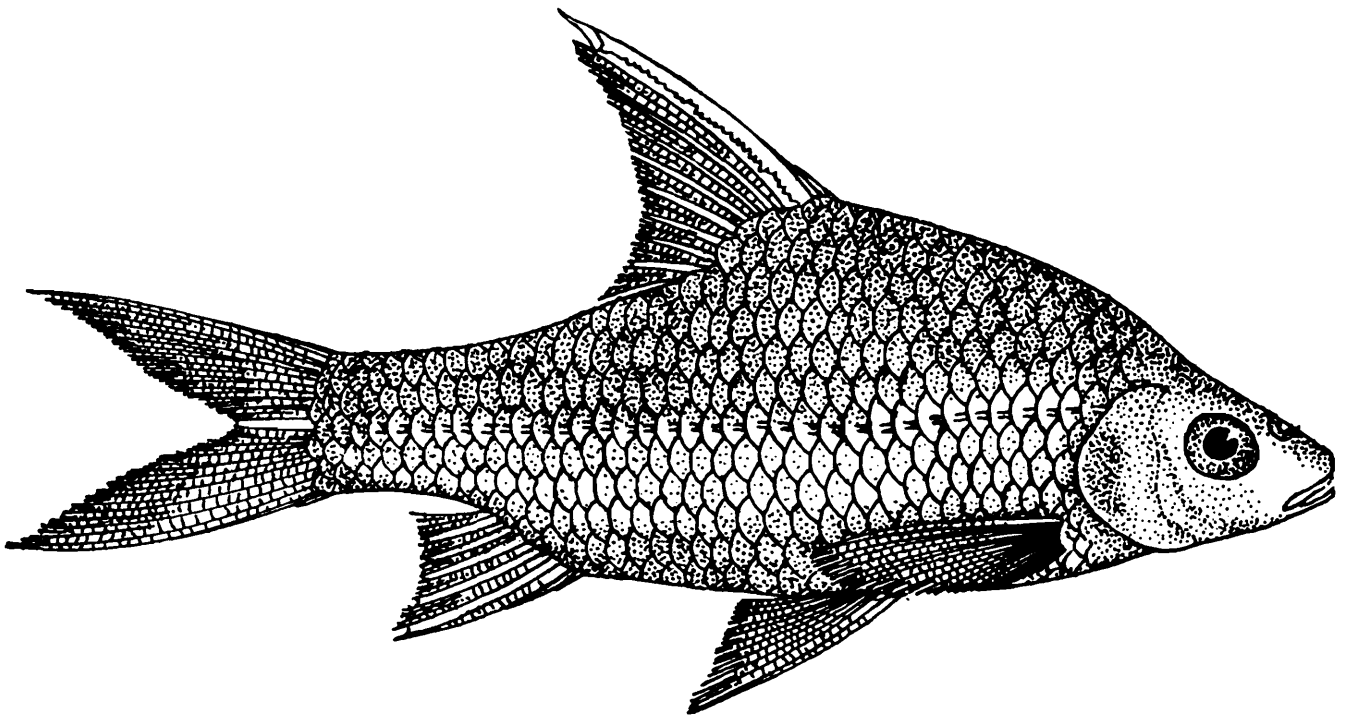
Specimens Studied : ZSI, F.2736, 1 ex., 150 mm SL Bassein, purchased from F.Day. ZSI, F.5684, 1 ex.,120 mm SL, Mandalay, Asiatic Soc. Bengal.

Diagnosis A deep bodied fish without any colour bands or blotch, no barbels, dorsal spine strong, osseous, long, longer than head, serrated, lateral line complete. A groove in front of nostrils on snout present.

Description : D. II-III, 7-8; P.15-16, V i,8; A. i-ii, 5; C. 15-16; LL. 36-38.

Dorsal profile steep upto dorsal fin. Ventral profile nearly flat upto anal fin end. Head short, conical. Head length 26.60 to 27.50, body depth 38.30 to 40.90 in percent of standard length. Head width 45.45 to 46.40, height of head at occiput 60.00 to 64.20, snout 31.81 to 32.14 in percent of head length. Snout conical, plain. Eyes large, 24.24 to 28.57 in percent of head length, 80.00 to 100.00 in percent of interorbital width 113.64 to 131.58 of snout length. Mouth subterminal, its width less than inter-nostril distance. Lips thin, plain. No barbels.

Dorsal fin inserted nearer caudal base than tip of snout. Last unbranched dorsal ray osseous, strong, serrated, the spine rather shorter than the body depth below it, but longer than head. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins extend to pelvics; latter just reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 85.70 to 94.40 in percent of its length. Lateral line complete.



Lateral view of *P. apogon*

Scales : PDS 12-15; Pre-anal 21, pre-pelvic 6 to 8.

Between LL and dorsal fin base $6\frac{1}{2}$ - $7\frac{1}{2}$

Between LL and pelvic fin base 5- $5\frac{1}{2}$

Between LL and anal fin base $5\frac{1}{2}$

Circumpeduncular 13 or 14

Gill Rakers : 5 + 8

Size : 200 mm TL.

Colour : Silvery, each scale with a dark spot at its base.

Distribution : Burma to Malay Archipelago. Record from Terai (Shaw & Shebbeare, 1938) its likely to be a misidentification.

Relationship : Distantly related to the *micropogon* group of species, different in distribution and other characters.

Additional Data :

SL/Pre dorsal	56.60 to 57.10	N = 2
SL/Pre anal	75.00 to 76.10	2
SL/Pre pelvic	46.60 to 47.60	N = 2
LH/LCPD	54.54 to 62.50	N = 2
LH/HCPD	51.50 to 53.50	N = 2
LH/Dorsal fin base	57.10 to 66.60	N = 2
LH/Width of Mouth	16.00 to 18.10	N = 2

The “*fraseri*” group**Species :**

P. fraseri (Hora & Misra), 1938, p.29

P. deccanensis Yazdani & Babu Rao, 1976, p.171

Common Characters :

1. Two barbels.
2. Dorsal spine ossified and serrated.
3. Lateral line scales 42 to 45.
4. PDS scales 13 to 16.
5. LL/Dorsal fin base 6 scales.
6. Circumpeduncular scales 14 to 16.
7. Dorsal fin base less than least depth of caudal peduncle.
8. Pre-pelvic 10 to 12, Pre-anal 20 to 21 scales.

***Puntius fraseri* (Hora & Misra)**

Barbus fraseri Hora & Misra, *J. Bombay nat. Hist. Soc.*, 40(1), p.29, pl.3, fig.2, 1938 (type locality, Darna River, Deolali, Maharashtra).- Menon & Yazdani, *Rec. zool. Surv. India*, 61(1 & 2), p.105 1968 (Syntypes in ZSI.)

Puntius fraseri, Jayaram, *Handbk, FW. Fish. India*, p.100 (distribution), p.107, (key), 1981.

Vernacular Names : NIL

Specimens Studied : ZSI F.12497/1, Syntypes, 5 exs, 31 to 34 mm SL, Darna river, Deolali, Maharashtra.

Diagnosis : A deep bodied fish without any bands on body, 2 barbels, dorsal spine strong, serrated, lateral line incomplete with 42-45 scales with a silvery streak becoming wider posteriorly and ending in a caudal spot.

Description : D. II, 8; P. 12; V 8; A. iii, 5; C. 19; LL. 42-45

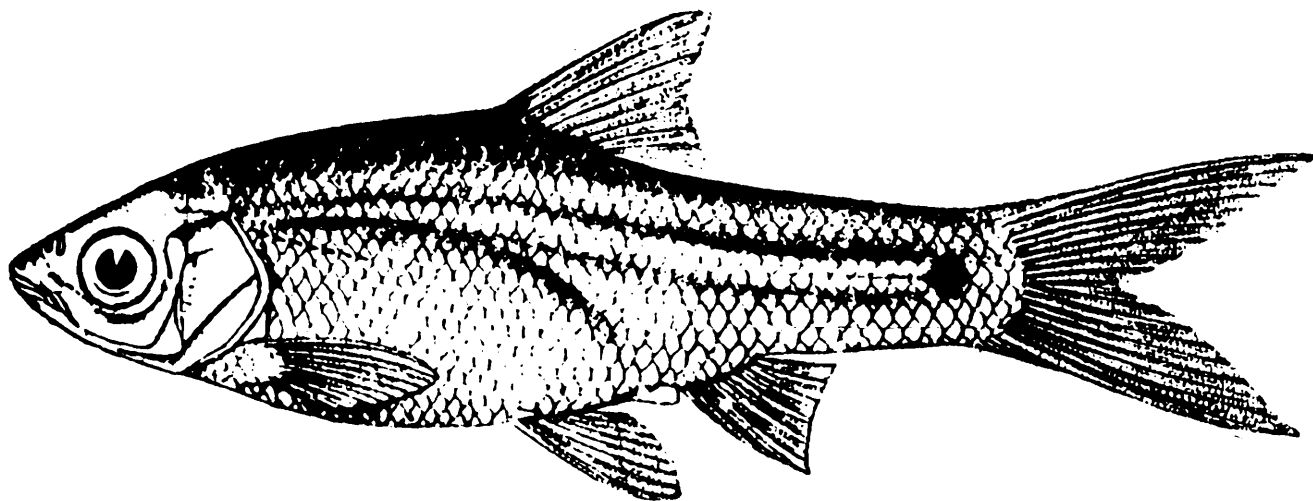
TABLE - 3
Comparison of the species of the "fraseri" group

Characters	<i>Puntius fraseri</i> (Hora & Misra), 1938 p.29	<i>Puntius deccanensis</i> Yazdani & Babu Rao, 1976, p.171
1. No. of barbels	Two	Two
2. Last unbranched dorsal ray	Ossified, serrated	Ossified, serrated
3. Lateral line	Incomplete 8-10 scales	Complete
4. LL scales	42 to 45	42 to 44
5. PDS	15 or 16	13 or 14
6. LL/Dorsal	6	6
7. LL/Pelvic	4 $\frac{1}{2}$	6 $\frac{1}{2}$
8. LL/Anal	4 $\frac{1}{2}$ to 5	5 $\frac{1}{2}$ to 6
9. Circumpeduncular	14 to 16	14 to 16
10. Prepelvic	12	10 to 12
11. Pre-anal	20	20 or 21
12. Gill Rakers	5 + 13	4 + 11
13. SL/LH	3.45 to 4.00	3.80 to 3.90
14. SL/BD	2.82 to 3.27	2.88 to 3.31
15. LH/Eye	3.00 to 3.60	3.40
16. LH/Snout	3.40 to 4.50	2.83
17. IOW/Eye	1.20 to 1.50	1.60
18. Snout/Eye	0.80 to 0.89	2.83
19. LCPD/HCPD	1.67 to 2.00	1.51
20. Mouth Width/ Int. Nost. Dist.	Greater than	Less than
21. Dorsal fin base	Less than HCPD	Less than HCPD
22. Colour	One spot on caudal base	No spot
23. Distribution	W. Ghats	Pune

Dorsal and ventral profiles slightly arched. Head small, broadly pointed. Head length 25.00 to 29.03; Body depth 30.58 to 35.48 in percent of standard length. Head width 55.56 to 59.52; height of head at occiput 66.67 to 88.89 in percent of head length, snout 22.22 to 29.41 in percent of head length. Snout blunt, with sensory pores. Eye large, lateral 27.78 to 33.33 in percent of head length, 66.67 to 83.33 in percent of interorbital width and 112.00 to 125.00 in percent of snout length. Mouth small, lunate, subanterior, its width greater than inter-nostril distance. Lips fleshy. A pair of short maxillary barbels.

Dorsal fin inserted midway between tip of snout and caudal base. Last unbranched dorsal rays osseous, strong and serrated. Dorsal fin base less than least height of caudal

peduncle. Pectoral fins do not extend to pelvic fins; latter with an axillary scale reach anal opening. Anal fin when laid flat not reaching the root of caudal fin. Least height of caudal peduncle 50.00 to 60.00 in percent of its length. Lateral line incomplete upto 8 to 10 scales.



Lateral view of *P. fraseri*

Scales : PDS 15 or 16; Pre-pelvic 12; Pre-anal 20.

Between LL and dorsal fin base	6
Between LL and pelvic fin base	4 ¹ / ₂
Between LL and anal fin base	4 ¹ / ₂ -5
Circumpenduncular	14-16

Gill Rakers 5 + 13

Size : 46 mm TL

Colour : In alcohol preserved specimens pale olivaceous, somewhat darker in dorsal surface. A silvery streak along the middle of body which becomes wider posteriorly. A round black spot on caudal base, and a somewhat smaller black spot also present at base of anterior rays of dorsal fin.

Distribution : INDIA : Darna river, Deolali, Poona, Maharashtra.

Relationship : Distantly related to *P. punjabensis* differing from it in having a strong, osseous, serrated dorsal spine, a pair of barbels and colouration.

Additional Data

TL/Head length	18.52 to 23.33	
TL/Body depth	18.47 to 23.25	
SL/Pre dorsal	48.39 to 53.12	N = 4
SL/Pre anal	64.52 to 68.18	N = 4
SL/Pre pelvic	41.93 to 53.03	N = 4

LH/Mouth width	22.22 to 23.81	N = 4
LH/LCPD	77.78 to 90.47	N = 5
LH/HCPD	50.00 to 53.57	N = 5
LH/Dorsal fin base	44.44 to 66.67	N = 4

Puntius deccanensis Yazdani & Babu Rao

Puntius deccanensis Yazdani & Babu Rao, *J. Bombay nat. Hist. Soc.*, 73, p.171, fig., 1976 (type locality, Nalla near Katraj tank, Poona).

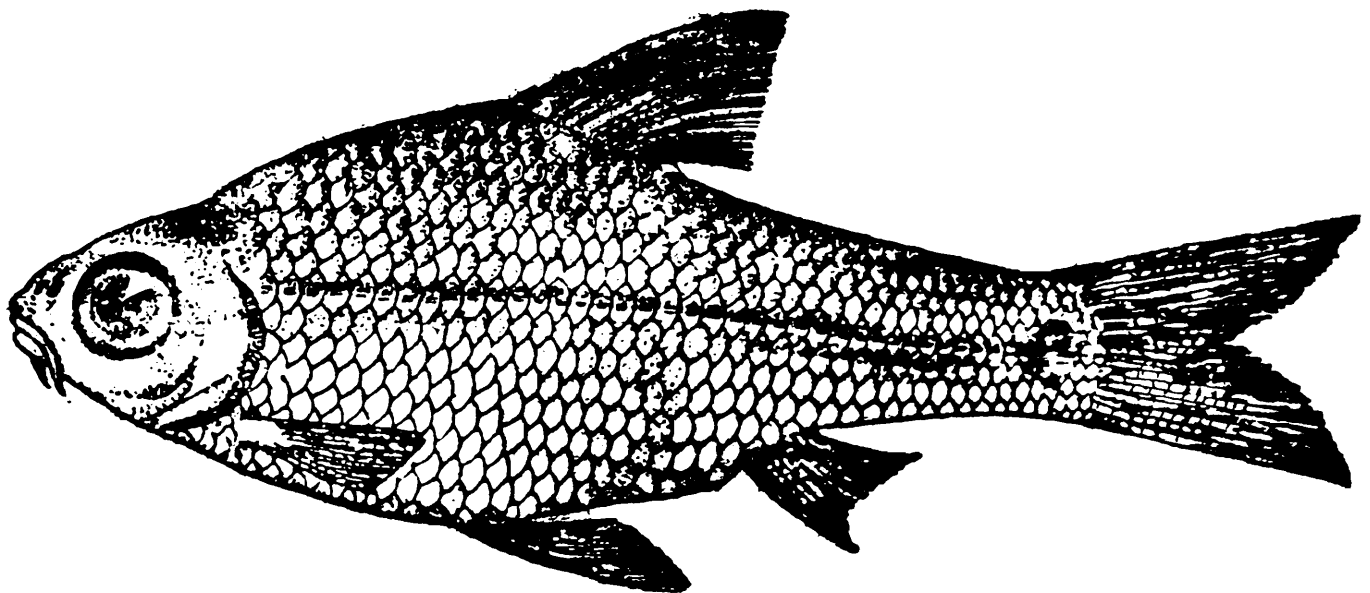
Vernacular Names : NIL

Specimens Studied : ZSI FF 1925 Holotype, 37 mm SL Katraj tank Poona.

Diagnosis : A deep bodied fish without any bands on body, 2 barbels, dorsal spine strong, serrated and lateral line complete. A ridge like longitudinal swelling present along posterior half of lateral line.

Description : D. II, 8-9; P. 11-14; V.i, 8; A. ii, 5; C. 19; LL. 42-44

Dorsal and ventral profiles convex. Head conical. Head length 25.60 to 26.30; body depth 30.20 to 34.70 in percent of standard length. Head width 58.82; height of head at occiput 82.35; snout 35.29 in percent of head length. Snout conical, plain. Eyes large in anterior half of head, 29.41 in percent of head length, 62.50 in percent of interorbital space width and 35.29 of snout length. Mouth subterminal, its width less than inter-nostril distance. Lips thin, plain. A single pair of maxillary barbels.



Lateral view of *P. deccanensis*

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray osseous, robust, serrated but serrated edge covered by a thin layer of skin. Dorsal fin base

less than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 66.11 in percent of its length. Lateral line complete.

Scales : PDS 13 or 14. Pre-anal 20 or 21. Pre pelvic 10 or 12

Between LL and dorsal fin base	6
Between LL and pelvic fin base	6 $\frac{1}{2}$
Between LL and anal fin base	5 $\frac{1}{2}$ to 6
Circumpeduncular	14 to 16

Gill Rakers : 4 + 11

Size : 48 mm TL

Colour : Dorsal half of head dark with a diffuse brown lateral band. Dorsally pigmented dark brown, from snout to caudal fin including the dorsal spine. Pigmentation becoming lighter laterally and the central half of body more or less without pigmentation. A group of jet black spots are present on the caudal peduncle. Dorsal fin base black anteriorly. Other fins colourless.

Distribution : INDIA: Poona.

Relationships : Close to *P. fraseri* Hora & Misra differing from it in having a complete lateral line and different scale counts besides the ridge like swelling along the mid line of body.

Remarks : Yazdani & Babu Rao (1976) while describing this species made a list of 46 species of *Puntius*, compared their new species with *P. macrolepidotus* (Day) from Burma and *P. ambassis* = *P. guaganio* Hamilton from Eastern India, with which this species has least resemblance. It is strange they have overlooked *P. fraseri* Hora & Misra described from the same area to which this species is related.

Additional Data : (Holotype only)

TL/Head length	19.10
TL/Body depth	29.22
SL/Pre dorsal	50.00
SL/Pre anal	65.71
SL/Pre pelvic	45.71
LH/Mouth width	23.53
LH/LCPD	105.88
LH/HCPD	64.71
LH/Dorsal fin base	58.88

The "jerdoni" group

Species :

P. jerdoni (Day), 1870, p.372

Common characters :

1. Four barbels.
2. Dorsal spine weakly ossified.
3. Lateral line complete.
4. LL scale 27-32.
5. PDS 9 to 12.
6. LL/Pelvic $2\frac{1}{2}$ to $3\frac{1}{2}$ scales.
7. LL/anal 3 to $3\frac{1}{2}$ scales.
8. Gill Rakers on lower limb of first arch 3-4 + 10 or 11.
9. Dorsal fin base greater than least depth of caudal peduncle.
10. No spots on tail or body.
11. Pre pelvic scales 10 to 13.
12. Confined to Western ghats.

Puntius jerdoni (Day)

Barbus jerdoni Day, *Proc. zool. Soc. Lond.*, p.372, 1870 (type locality, Rivers in Canara).- Day, *Fish. India*, p.568, pl.138, fig.5, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.312, 1889.- Annandale, *Rec. Indian Mus.*, 16, p.137, 1919 (streams of Bombay presidency).

Barbus (Barbodes) dobsoni Day, *J. Linn. Soc.*, 12, p.574, 1876 (type locality, Deccan).

Barbus dobsoni Day, *Fish. India*, p.568, pl.139, fig.6, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.312, 1889.- Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (synonym of *P. jerdoni*, name only).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 43(2), p.220, 224, 1942 (synonym with *jerdoni*).- Hora, *J. Bombay nat. Hist. Soc.*, 44(1), p.2, 1943 (name only, Ghol river, Maharashtra, synonymous with *jerdoni*).

Barbus jerdoni maciveri Annandale, *Rec. Indian Mus.*, 16, p.137, 1919 (type locality, Krishna river near Mahuli, Satara).- Menon & Yazdani, *Rec. zool. Surv. India*, 61(1 & 2), p.105, 1968 (syntypes in ZSI).

Barbus (Puntius) jerdoni, Hora, *Rec. Indian Mus.*, 44, p.195, 1942 (name only, distribution, Coorg, Wynaad, Nilgiris).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 43(2), p.220, 224, TF.1, 1942 (synonymous with *B. jerdoni*).- Silas, *J. Bombay nat. Hist. Soc.*, 49(4), p.674, 1951 (Vanmadi bridge, Anaimalai hills, Ponnani drainage, as a separate taxa).

Puntius jerdoni maciveri, Silas, *J. Bombay nat. Hist. Soc.*, 51, p.581, 1953 (Krishna river at Wai, Maharashtra).- Rajan, *J. Bombay nat. Hist. Soc.*, 53(1), p.45, 1955 (name only, Bhavani and Moyar rivers, Nilgiris).

Puntius jerdoni, Jayaram, *Handbk. FW. Fish. India*, p.101 (distribution), p.105 (key), 1981.- Jayaram *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.59, 1982 (key, Cauvery river, S. India, sexual dimorphism discussed).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.37, 1984 (Common & vernacular names).

Barbus (Barbodes) pulchellus Day, *Proc. zool. Soc. Lond.*, p.372, 1870 (type locality, S. Canara).

Barbus pulchellus Day, *Fish. India*, P.568, pl.150, fig.3, 1878.- Day, *Fauna Brit. India. Fish.*, 1, p.311, 1889.- Hora, *Rec. Indian Mus.*, 39, p.17, 1937 (Tunga river at Shimoga).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 43(2), p.220, 224, 1942 (considered synonym of *P. jerdoni*).- David, *Proc. nat. Inst. Sci. India*, 22B(3), p.152, 1956 (Bhadra river at Bhadravatai).- Venkateswarlu & Rama Rao, *Occ Paper zool. Surv. India*, No.87, p.13, 1986 (synonymised with *P. jerdoni*).

Barbus (Puntius) pulchellus, Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (name only, Karnataka).

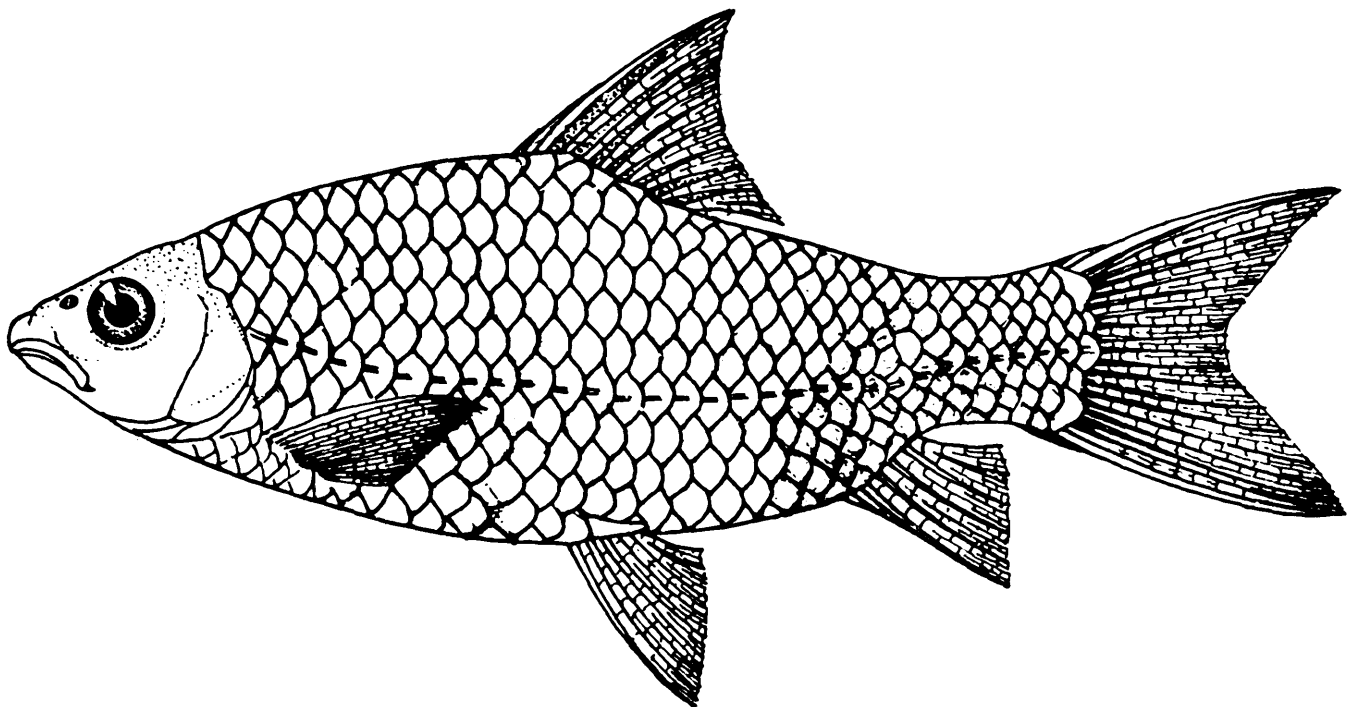
Puntius pulchellus, Rajan, *J. Bombay nat. Hist. Soc.*, 53(1), p.45, 1955 (name only, Bhavani & Moyar rivers, Nilgiri Hills).- Jayaram, *Handbk. FW. Fish. India*, p.102 (distribution), p.105 (key), 1981.- Jayaram *et al.*, *Occ. Paper zool. Surv. India*, No. 36, p.62, 1982 (key, Cauvery river, S. India).-Venkateswarlu, *Occ. Paper Zool. surv. India*, No.56, p.38 1984 (common & vernacular names).

Vernacular Names Say-meen, Kan; Cha-meen, Tel; Ta-meen, Mal;

Specimens Studied : ZSI, F.2726, 1 ex., Holotype of *B. dobsoni*, 144.5 mm SL, Deccan, F. Day. ZSI, F.9576/1, 1 ex., syntype of *B. jerdoni maciveri*, 120 mm SL., Krishna river, Bombay presidency, N. Annandale coll. ZSI, SRS, Unregd. 2 exs., 128 and 196 mm SL, River Krishna at Pachwad near Karad, Satara district, Maharashtra State, 31.12.87., KCJ coll. ZSI, SRS unregd. 1 ex., 125 mm SL, River Krishna at Menavali village near Dhom reservoir, Satara district, Maharashtra State, 2.1.88, KCJ coll. Dhom reservoir, Satara district, Maharashtra State, 2.1.88, KCJ coll.

Diagnosis : a moderately deep bodied fish without any bands or spots on body, four barbels, dorsal ray weak, articulated and lateral line complete with 26 to 32 scales.

Description D. III, 8-9; P. 14-15; V.i, 8; A. ii-iii, 5; C. 19; LL. 27-32.



Lateral view of *P. jerdoni*

Dorsal and ventral profiles arched with a distinct rise upto the dorsal fin base. Head short, head length 20.00 to 27.39, body depth 28.57 to 38.02 in percent of standard length.

Head width 54.34 to 67.11, height of head at occiput 72.99 to 95.23, snout 28.01 to 37.31 in percent of head length. Eyes superior, 24.50 to 32.05 in percent of head length, 51.28 to 68.2 in percent of inter-orbital width and 65.79 to 94.74 of snout length. Mouth narrow, terminal, its width less than inter-nostril distance. Lips thin, plain. Two pairs of barbels.

Dorsal fin inserted midway between tip of snout and base of caudal fin. Last unbranched dorsal ray weak, articulated. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins nearly extending to pelvic fins; latter in turn not reaching anal opening. Anal fin when laid flat nearly reaching root of caudal fin. Least depth of caudal peduncle 73.17 to 85.11 in percent of its length. Lateral line complete.

Scales : PDS 9 to 12; pre anal 20 or 21; Pre pelvic 10 to 13

Between LL and dorsal fin base $5\frac{1}{2}$ to $6\frac{1}{2}$

Between LL and pelvic fin base $2\frac{1}{2}$ to $3\frac{1}{2}$

Between LL and anal fin base 3 to $3\frac{1}{2}$

Circumpeduncular 9 to 11

Gill Rakers : 3 or 4 + 10 - 11

Size : 450 mm TL

Colour : Bluish above, becoming lighter on sides and beneath, fins edged with grey to orange, caudal tipped black.

Distribution : INDIA : Deccan, along the W. ghats from Wai to Anaimalai Hills.

Remarks : Hora & Misra (1942) demonstrated after examination of several examples including types that *B. dobsoni* Day, *B. jerdoni maciveri* Annandale and *B. pulchellus* Day are all synonymous with this species. They showed further that the presence or absence of tubercles on the snout is due to sexual dimorphism.

Relationships : Distantly related to *sophore* group differing from it in having the dorsal ray weak, articulated, without any colour spots, and body proportions.

Additional Data : N= 5

TL/Body depth	22.03 to 28.17	N = 3
TL/Head length	17.76 to 21.10	N = 3
SL/Pre dorsal length	48.34 to 52.91	
SL/Pre anal	71.43 to 84.75	
SL/Pre pelvic	42.50 to 51.81	
LH/LCPD	64.10 to 74.63	N = 3
LH/HCPD	47.16 to 63.69	N = 3
LH/Dorsal fin base	57.14 to 74.60	
LH/Mouth width	21.45 to 36.10	

The “*chola*” group

This group comprises three complexes of species : i. *chola*, ii. *amphibius*, iii. *bimaculatus*. A comparison of the complexes is presented in Table 4.

Common Characters :

1. Two barbels.
2. Lateral line complete.
3. Lateral line scales 21 to 29.
4. Pre-dorsal scales not more than 10 (7 to 10).
5. Pre-pelvic scales 5 to 8.
6. Pre-anal scales 11 to 15.

TABLE - 4
Comparison of the three complexes of the *chola* group

Sl No.	Characters	“ <i>chola</i> ”	“ <i>amphibius</i> ”	“ <i>bimaculatus</i> ”
1.	Last unbranched dorsal ray	Ossified	Weakly to strongly ossified	Weakly ossified
2.	SL/Body depth	1.93 to 3.18	2.75 to 4.00	2.78 to 4.52
3.	LH/Snout	2.22 to 3.81	2.22 to 3.25	2.92 to 3.83
4.	Colour spots	Present	Present	May be present
5.	Colour band	Absent	Absent	Present
6.	Distribution	Wide	South India	Western Ghats, Madras, Sri Lanka
7.	Species	<i>P. chola</i> (Ham), 1822 p. 312 <i>P. parrah</i> (Day), 1865, p.301 <i>P. burmanicus</i> (Day) 1878, p.572	<i>P. amphibius</i> (Val), 1842, p. 478 <i>P. dorsalis</i> (Jerdon) 1849, p.314 <i>P. cauveriensis</i> Hora, 1937, p.20	<i>P. bimaculatus</i> (Bleeker), 1864 p. 17 <i>P. denisonii</i> (Day), 1865, p.299 <i>P. melanostigma</i> (Day), 1878, p. 573 <i>P. aarenatus</i> (Day), 1878, p. 574

TABLE - 5
Comparison of the species of the "chola" group
"chola" complex

Characters	<i>P. chola</i> (Ham), 1822, p.312	<i>P. parrah</i> Day, 1865, p.301	<i>P. burmanicus</i> (Day) 1878, p.572
1. No. of barbels	Two	Two	Two
2. Last unbranched dorsal ray	Ossified smooth	Ossified smooth	Ossified smooth
3. Lateral line	Complete	Complete	Complete
4. LL scales	24 to 29	25 to 26	23 to 28 (23-25 common)
5. PDS	7 to 9	8 to 10	7 to 9
6. LL/Dorsal	4 to 5½	4½ to 5½	4½ to 5½
7. LL/Pelvic	3 to 3½	2½ to 3½	2½ to 3½
8. LL/Anal	3½	3½ to 4	2½ to 3½
9. Circumpeduncular	11 or 12	10 or 11	10 or 11
10. Pre-anal	12 or 13	12 to 14	11 to 14
11. Pre-pelvic	5 or 6	5 to 7	6 or 7
12. Gill Rakers	2 to 3 + 13	6-8 + 12-15	3 to 6 + 15 to 17
13. SL/LH	2.07 to 4.02	3.25 to 3.75	3.14 to 3.84
14. SL/Body depth	1.93 to 3.18	2.40 to 3.13	2.23 to 2.49
15. LH/Eye	3.00 to 5.50	3.20 to 5.00	3.22 to 4.20
16. LH/Snout	2.22 to 3.75	2.93 to 3.71	2.70 to 3.81
17. IOW/Eye	1.00 to 1.75	1.14 to 1.80	1.00 to 1.80
18. Snout/Eye	0.75 to 2.00	0.93 to 1.42	1.00 to 1.43
19. LCPD/HCPD	1.00 to 1.75	1.18 to .50	1.09 to 1.58
20. Mouth Width	= or less than IND	less than IND	Less than IND
21. Dorsal fin base	Greater than HCPD	Greater than HCPD	Greater than
22. Colour	Two spots one near gill opening; another on 21-23rd scale	One spot 20-22 scales	Dull blotch on caudal base
23. Distribution	Wide	South India	Burma

TABLE - 5
 Comparison of the species of the "chola" group
 The "*bimaculatus*" complex

<i>P. bimaculatus</i> (leeker) 1864, p.17	<i>P. denisonii</i> (Day), 1865, p.299	<i>P. melanostigma</i> (Day), 1878, p.573	<i>P. arenatus</i> (Day), 1878, p. 574
Two	Two	Two	Two
Not osseous, smooth	Weakly ossified smooth	Weakly ossified, smooth	Weakly ossified smooth
Complete	Complete	Complete	Complete
23 or 24	23 to 26	23-26	24 to 27
8-9	9	8 or 9	8 to 10
3 ¹ / ₂ - 4	4 ¹ / ₂	4 ¹ / ₂ - 5	4 ¹ / ₂ - 5
2 ¹ / ₂	2 ¹ / ₂	2 ¹ / ₂ - 3 ¹ / ₂	2 ¹ / ₂ to 3 ¹ / ₂
2 ¹ / ₂	2 ¹ / ₂	2 ¹ / ₂ - 3 ¹ / ₂	2 ¹ / ₂ - 3 ¹ / ₂
10 or 11	11	9 or 10	10 or 11
13 to 15	14	11-14	10 to 13
6 or 7	7	5 - 7	6 to 8
4 + 10	4 + 12	7-8 + 9-10	5 + 16
2.75 to 3.54	4.52	3.48 - 3.68	3.24 to 3.75
3.26 to 3.73	3.78	2.78 - 3.26	3.00 to 3.67
3.24 to 4.33	3.54	3.17 - 4.60	3.56 to 4.58
3.25 to 3.67	2.87	2.92 - 3.83	2.72 to 3.75
1.00 to 1.67	1.08	1.08 1.80	1.33 to 1.83
1.00 to 1.33	1.23	1.07 to 1.33	1.00 to 1.50
1.15 to 1.50	1.95	1.18 1.61	1.41 to 2.00
less than IND	less than IND	less than IND	> IND
Greater than HCPD	greater than HCPD	greater than HCPD	> HCPD
Two longitudinal bands	A longitudinal band	One spot on 21 - 22 scale	A dark band on dorsal fin
Sri Lanka	Kerala	Western Ghats	Vaigai drainage Tamil Nadu

TABLE - 5
Comparison of the species of the "chola" group
"amphibius" complex

Characters	<i>P. amphibius</i> , (Val.) 1842, p.478	<i>P. dorsalis</i> (Jerdon), 1849 p. 314	<i>P. cauveriensis</i> (Hora) 1937, p.20
1. No. of barbels	Two	Two	Two
2. Last unbranched dorsal ray	Feebly ossified smooth	Ossified smooth	Ossified smooth
3. Lateral line	Complete	Complete	Complete
4. LL scales	21-28 (normally 24-25)		22-28 (25-26) 23-27
5. PDS	7-9 (8)	8-9 (9)	8-9
6. LL/Dorsal	4 to 4 $\frac{1}{2}$	4 $\frac{1}{2}$ - 5 $\frac{1}{2}$	4-5 $\frac{1}{2}$
7. LL/Pelvic	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3 $\frac{1}{2}$
8. LL/Anal	2 $\frac{1}{2}$ - 3 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{1}{2}$
9. Circumpeduncular	10 or 11	9 or 10	9 or 10
10. Pre-anal	13-14	11-13	12-14
11. Pre-pelvic	6-7	5-6	5-7
12. Gill Rakers	6+15	6-7 + 10-13	5-6 + 19-21
13. SL/LH	3.00-3.76	3.14 to 3.84	3.27 - 3.75
14. SL/Body depth	2.95 - 4.00	2.90 to 3.25	2.75 - 3.56
15. LH/Eye	3.00 - 4.10	3.10 to 4.75	4.17 - 5.42
16. LH/Snout	2.22 - 2.52	2.69 - 3.14	2.57 - 3.25
17. IOW/Eye	1.00 - 1.49	1.00 - 1.73	1.17 - 1.83
18. Snout/Eye	1.00 to 1.49	1.00 - 1.73	1.33 - 1.86
19. LCPD/HCPD	1.33 - 1.60	1.30 - 1.70	1.30 - 2.00
20. Mouth Width	= or less than IND	less than IND	less than IND
21. Dorsal fin base	greater than HCPD	greater than HCPD	less than HCPD
22. Colour	One spot on caudal base	One spot on caudal base	
23. Distribution	S. India.	S. India	S. India

Puntius chola (Hamilton)

Cyprinus chola Hamilton, *Fish. Ganges*, pp.312, 389, 1822 (type locality, north-eastern parts of Bengal).- Valenciennes, *Hist. Nat. Poiss.*, 16, p.410, 1842.

Cyprinus titius Hamilton, *Fish. Ganges*, pp.315, 389, 1822 (type locality, ponds near Calcutta).- Valenciennes, *Hist. Nat. Poiss.*, 16, p.399, 1842.

Barbus titius, Shaw & Shebbeare, *J. roy. Asiat. Soc. Bengal*, 3(1), p.44, text.fig.39, pl.5, 1937 (Terai & Duars).

Cyprinus tictis Hamilton, *Fish Ganges*, p.316, 1822.-Hora, *Mem. Indian Mus.*, 9, p.189, pl.23, fig.6, 1929.

- Cyprinus chola*, McClelland, *Asiat. Res.*, 9, pp.286, 384, pl.58, fig.3, 1839 (fig. from Hamilton's MS drawings).
- Systomus tetrapagus* McClelland, *Asiat. Res.*, 9, pp.285, 381 pl.44, fig.3, 1839 (type locality, Brahmaputra and ponds in Assam).
- Copoeta chola*, Bleeker, *Verh. Bat. Gen.*, 25, p.62, 1853.
- Systomus titius*, Bleeker, *Verh. Bat. Gen.*, 25, p.62, 1853.
- Barbus titius*, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.154, 1868. -Shaw & Shebbeare, *J. Asiat. Soc. Beng.*, 3, p.44, pl.5, fig.4, text. fig.39, 1937 (N. Bengal).- Hora & Gupta, *J. Asiat. Soc. Beng.*, 6(2), p.82, 1941 (considered distinct).
- Systomus sophore* Bleeker, *Verh. Bat. Gen.*, 25, p.127, 1853.
- Systomus immaculatus* Blyth, *J. Asiat. Soc., Beng.*, p.157, 1860.
- Barbus liacanthus* Gunther (in part), *Cat. Fish. Brit. Mus.*, 7, p.141, 1868.
- Barbus sophoroides* Gunther, *Cat. Fish. Brit. Mus.*, 7, p.144, 1868.
- Barbus thermalis* Gunther, *Cat. Fish. Brit. Mus.*, 7, p.143, 1868.
- Barbus chola*, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.144, 1868.- Day, *Fish. India*, p.571, pl.142, fig.4, 1878. -Day, *Fauna Brit. India Fish.*, 1, p.317, 1889. -Annandale, *Rec. Indian Mus.*, 1, p.41, 1907 (name only, Port Canning, West Bengal).- Jenkins, *Rec. Indian Mus.*, 3, p.287, 1909.- Jenkins, *Rec. Indian Mus.*, 5, p.138., 1910.- Chaudhuri, *Rec. Indian Mus.*, 6, p.15, 1911 (Bhamo, Burma).-Chaudhuri, *Rec. Indian Mus.*, 8, p.243, 1913.- Mukerji, *J. Bombay nat. Hist. Soc.*, 38(1), p.8, 1934 (Mali Hka river, Myitkyina dist., Burma).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 39(3), pp.506, 508, 1937 (Dar na river, Deolali, Maharashtra).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 40(1), p.22, 1938 (Deolali).- Hora, *Rec. Indian Mus.*, 40(2), p.174, 1938 (Ganga river, Sakrigali ghat, Santal parganas).- Misra, *Rec. Indian Mus.*, 40, p.258, 1938 (Kodur, Cuddapah dist., Nallamalai hills, Eastern Ghats).- Hora & Pillay, *FAO Fish. Biol. Tech. Pap.*, (14) p.61, 1962 (key characters for identification of fry). David, *Proc. nat. Inst. Sci. India*, 22B(3), p.153, 1956 (Bhadra river at Bhadravati).- Dutt & Murty, *Mem. Soc. Zool. Guntur*, 1, p.7, 1976 (Kolleru lake, Andhra Pradesh).
- Barbus tetrapagus* Day, *Fish. India*, p.572, pl.142, fig.6, 1878.- Day, *Fauna Brit. India*, 1, p.318, 1889.- Das, *Rec. Indian Mus.*, 41(4), p.441, 1939 (Hazaribagh dist., Bihar).- Venkateswarlu & Rama Rao, *Occ. Paper zool. Surv. India*, No. 87, p.13, 1986 (synonym of *P. chola*).
- Barbus (Puntius) tetrapagus*, Job, David & Das, *Indian J. Fish.*, 2(1), p.33, 1955 (Mahanadi below Hirakud Dam).
- Barbus (Puntius) chola*, Hora, *Rec. Indian Mus.*, 38(1), p.1, 1936 (Chitaldrug dist., Karnataka).- Hora, *Rec. Indian Mus.*, 44, p.195, 1942 (name only).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 43(2), p.220, 1942 (Poona).- Menon, *Rec. Indian Mus.*, 47(2), p.232, 236, 1949 (Nirmali, Kosi drainage).- Job, David & Das, *Indian J. Fish.*, 2(1), p.32, 1955 (Mahanadi below Hirakud Dam).- Murty, *Proc. Indian Acad. Sci.*, 85B(3), p.127, 1977 (Lake Kolleru, description).
- Barbus (Puntius) tetrapagus*, Hora, *Rec. Indian Mus.*, 42(2) p.369, 1940 (name only, Dhamtari Bazar, Mahanadi, M.P.). -Hora & Gupta, *J. Asiat. Soc. Beng.*, 6(2), p.82, 1941 (considered synonymous with *P. titius*).
- Barbus (Puntius) titius*, Hora & Nair, *Rec. Indian Mus.*, 43, p.366 (Itarsi), p.367 (Harda, Hoshangabad dist., M.P. as a separate taxon), 1941.- Hora & Gupta, *J. Asiat. Soc. Beng.*, 6, p.82, 1941 (duars, West Bengal, as a separate taxon).
- Puntius titius*, Mirza, *Biologia*, 20(1), p.78, 1974 (name only, Indus plain and adjoining hills).- Mirza & Ahmad, *Biologia* 20(1), p.100, 1974 (name only, D.I. Khan, Pakistan).- Mirza, *Bijdr. Dierk.*, 45(2), p.169, 172, 1975 (Aba-Sinh divn., Indus plain, Pakistan).- Mirza, *Biologia*, 22(1), p.115, 1976 (name only, Montane and submontane regions of Pakistan).- Jayaram & Singh, *Rec. zool. Surv. India*, 72, p.254, 1977 (R. Karotoyar, W.Bengal). -Srivastava, *Fishes of UP & Bihar*, p.71, fig.50, 1980 (key, description, treated as a separate taxa).- Rahman, *Bangladesh, J. Sci & Indus. Res.*, 9(3 & 4) p.201 (name only, Bangladesh, Bengali Name), p.154 (key for identification), 1974.- Rahman, *Bull. FW. Fish. Res. Stn. Chandpur*, No.1, p.8, 1974 (name only, checklist, Bangladesh).
- Puntius chola*, Deraniyagala, *Spolia Zeylanica*, 16(1), p.14, 1930 (description, distribution in Sri Lanka; considers *Leuciscus thermalis* Val. synonymous).- Deraniyagala, *Spolia Zeylanica*, 24(3), p.175, 1946 (Colombo,

Yakvala).- Silas, *Bull. Nat. Inst. Sci. India*, No.7, p.251, 1952 (name only, Sri Lanka).- Chauhan & Ramakrishna, *Rec. Indian Mus.*, 51, p.404, 1953 (Tel river, Balangir dist., Orissa).- Munroe, *Marine & FW. Fish. Ceylon*, p.44, 1955 (Sri Lanka).- Rajan, *J. Bombay nat. Hist. Soc.*, 53(1), p.45 1955 (Bhavani & Moyar rivers, Nilgiri Hills).- Motwani & David, *J. zool. Soc. India*, 9(1), p.11, 1957 (Sone river, Bihar).- Motwani et al. *Trop. Ecol.* 3(1 & 2), p.20, 1962 (R. Brahmaputra).- Rajan, *Proc. Indian Acad. Sci.*, 58, p.296, 1963 (Moyar river, Nilgiri Hills).- Menon, *Rec. zool. Surv. India*, 59(4), p.379, 1964 (Madukkarai, Pondicherry, Karaikkal, Bahur near Cuddalore).- Datta & Majumdar, *Rec. zool. Surv. India*, 62(1 & 2), p.88, 1970 (River Bearch Udaipur, Alwar, Madhopur, Jhalawar, Bharatpur district, Rajasthan).- Venkateswarlu, *Indian J. Zootomy*, 13(3) p.122, 1972 (name only, Bihar).- Venkateswarlu & Rama Rao, *Seafood Export J.*, 5(6), p.3, 1973 (vernacular names in Gangetic delta).- Rahman, *Bangladesh, J. Sci. & Indus. Res.*, 9(3 & 4), p.201 (name only, Bangladesh, Bengali name), p.154 (key for identification), 1974.- Rahman, *Bull. FW. Fish. Res. Stn., Chandpur*, No.1, p.8, 1974 (name only, checklist, Bangladesh).- Menon, *Spl. Publ. No.1, Inl. Fish. Soc. India*, p.37, 1974 (check-list of Himalayan Indo-Gangetic plain fishes).- Venkateswarlu, *Acta Ichthyol. Piscatoria*, 6(1), p.92, 1976 (R. Ganga near Patna).- Yazdani, *J. Bombay nat. Hist. Soc.*, 74(1), p.20, 1976 (Khasi Hills, first record).- Jayaram et al., *Bull. Madras Govt Fisheries dept.*, 7, p.1, 1976 (name only, Cardamon hills).- Singh, *Rec. zool. Surv. India*, 71, p.124, 1976 (Purnea, N. Bihar).- Pillai & Yazdani, *Rec. zool. Surv. India*, 72, p.5, 1977 (Garo Hills, Meghalaya).- Jayaram & Singh, *Rec. zool. Surv. India*, p.72, p.251, 1977 (R. Dharla, Jalpaiguri, N. Bengal).- Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*, 9(1), p.52, 1979 (name only, list of Ganga fishes).- Mirza, *Proc. Ist. Pakistan Congr. Zool.*, p.15, 1980 (checklist, distribution in Pakistan & Azad Kashmir).- Srivastava, *Fishes of UP & Bihar*, p.60, fig.41, 1980 (key, description).- Butt & Mirza, *Biologia*, 27(2), p.155, 1981 (Peshawar Valley, NWFP, Pakistan).- Jayaram, *Handbk. FW. Fish. India*, p.100 (distribution), p.107 (key), 1981.- Jayaram et al. *Occ. Paper zool. Surv. India*, No.36, p.54, 1982 (key, Cauvery river, S. India).- Mirza & Abdussamad, *Biologia*, 28(1), p.65, 1982 (description, Pakistan).- Husain & Tilak, *Rec. zool. Surv. India*, 81, p.274, 1984 (name only, Faizabad district, U.P.).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.36, 1984 (common and vernacular names).- Sen, *Occ. Paper zool. Surv. India*, No.64, p.84, 1985 (Assam).- Lipton, *Matsya*, 9 & 10, p.113, 1985 (Tripura).

Leuciscus thermalis Valenciennes, *Hist. Nat. Poiss.*, 17, p.94, pl.490, 1843 (type locality, Sri Lanka).

Barbus thermalis, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.143, 1868.- Day, *Fish. India*, p.580, 1878.- Day, *Fauna Brit. India Fish.*, 1, p.330, 1889.- Venkaateswarlu & Rama Rao, *Occ. Paper zool. Surv. India*, No.87, p.14, 1986 (Synonym of *P. chola*).

Barbus (Puntius) thermalis, Hora & Mukerji, *Rec. Indian Mus.*, 30(1), p.46, 1928 (name only, hot spring of Kanniya, Sri Lanka).

Puntius thermalis, Jayaram, *Handbk. FW. Fish. India*, p.103 (distribution), p.109 (key), 1981.

Systomus unimaculatus Blyth, *J. Asiat. Soc. Beng.*, 29, p.159, 1860 (type locality, Sittang River, Burma).

Barbus unimaculatus, Day, *Proc. zool. Soc. Lond.*, p.557, 1869.- Day, *Fish. India*, p.581, pl.145, fig.5, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.331, 1889.

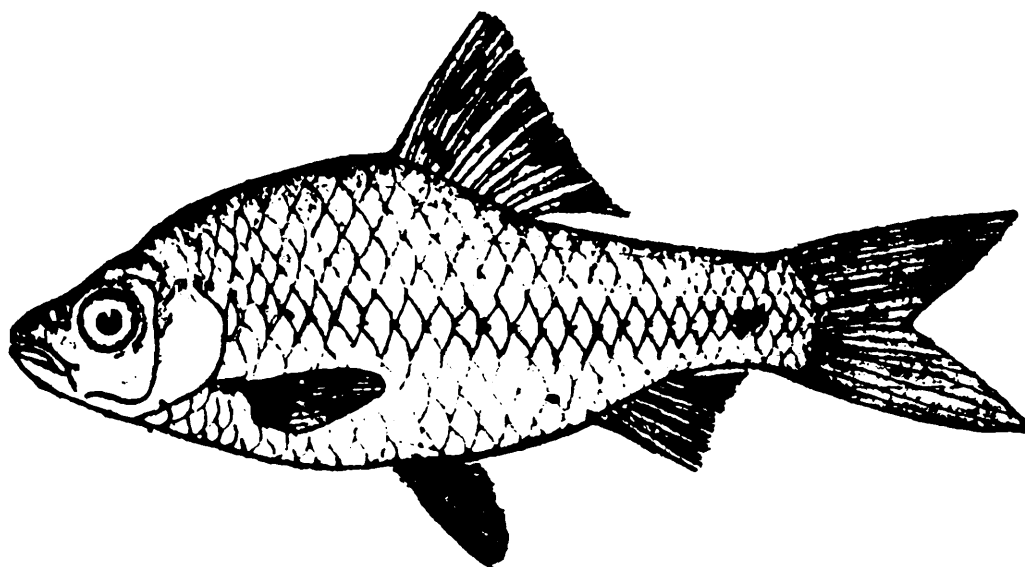
Puntius unimaculatus, Jayaram, *Handbk. FW. Fish. India*, p.103 (distribution), p.110 (key), 1981.

Vernacular Names : *Kerrundi*, Beng; *Katcha karaiva*, *Sidhari*, Hind; *Dhoddakarse*, Kan; *Poovali*, Mal; *Pittha Kerrundi*, *Pitia kerundi* Ori; *Ticker*, *Chidhu*, Pun; *Koroon*, *Pulli kendai*, *Macha Kendai*, *Vannathi*, *Poovali kendai*, *Servali kendai*, *Kooran kendai*, Tam; *Chaddu paddaka*, Pakki, Tel.

Specimens Studied : ZSI, F.13082/1, 1 ex., 71 mm SL., Mahanadi irrigation canal Rudri, Orissa, Dr. H. S. Rao Coll. (*P. titius*) ZSI, SRS, unreg. 78 exs., 32.5 to 83.0 mm SL, Cauvery river, different localities KCJ Coll. 1973, 1974, 1977. ZSI, F.4701/1, 1 ex., 93.5 mm SL., Bhamo, Burma, J. Coggin Brown Coll. ZSI, F.4706/1, 1 ex., 62.0 mm SL., Bhamo, Burma J. Coggin Brown Coll. ZSI, F.2203/1, 1 ex., 41.5 mm SL., Soni Gaon Bheel, Lokpa, Batipara, Assam, S.L. Hora Coll. 8.11.1939. ZSI, F.4009/2, 1 ex., 54.00 mm SL., Sukla Talai, Jhalwar, Rajasthan, N. Majumdar & R.N. Bhargava Coll. 1963.

Diagnosis : A small deep bodied fish without any colour bands on body, two barbels, dorsal ray ossified as a smooth short spine, lateral line complete with 24 to 29 scales. Black spot one after gill opening and at the caudal base and another on dorsal fin present.

Description : D.III-IV, 8; P.14-17; V.i, 8; A.ii-iii, 5; C.19; LL.24-29.



Lateral view of *P chola*

Dorsal and ventral profiles gently arched. Head moderately small and pointed. Head length 24.87 to 48.30, body depth 31.48 to 51.81 in percent of standard length. Head width 42.92 to 63.69, height of head at occiput 59.52 to 95.24, snout 26.67 to 45.05 in percent of head length. Snout plain, bluntly pointed.

Eyes moderate, 18.18 to 33.33 in percent of head length, 57.14 to 100.00 in percent of interorbital width, 50.00 to 133.33 of snout length. Mouth antero-superior, its width equal to or less than inter-nostril distance. Both lips equally reflected. A single pair of barbels.

Dorsal fin inserted equidistant between tip of snout and caudal fin base, occasionally nearer snout. Last unbranched dorsal ray ossified into a strong smooth spine. Dorsal fin base greater than height of caudal peduncle. Pectoral fins do not extend to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 57.14 to 100.00 in percent of its length. Lateral line complete.

Scales : PDS 7 to 9; Pre-anal 12 or 13; Pre-pelvic 5 or 6

Between LL and dorsal fin base	4 to 5 $\frac{1}{2}$
Between LL and pelvic fin base	3 to 3 $\frac{1}{2}$
Between LL and anal fin base	3 $\frac{1}{2}$
Circumpeduncular	11 or 12

Gill Rakers : 2-3 + 13

Size : 125 mm TL

Colour : Dark brown on dorsal and above lateral line; light brown below and underneath. Two conspicuous dark spots, generally between the 21st and 23rd scale and another near the gill opening. A dark mark at base of anterior dorsal ray also present. Some specimens may show a scarlet red longitudinal band extending from the gill opening to caudal base when fresh.

Distribution : Throughout India, Pakistan, Nepal, Bangladesh, Burma and Sri Lanka.

Relationship : Close to *P. sophore* differing from it in colour pattern and possession of a pair of maxillary barbels.

Leuciscus thermalis Valenciennes (1842) from Sri Lanka is considered synonymous with this species by Gunther (1868). Deraniyagala (1930) agreed with this view having examined the type in Paris Museum and also having had the concurring opinion of Dr. J. Pellegrin. Following this, *thermalis* is synonymised with *P. chola*, although the former is bereft of any barbels unlike the latter possessing a pair. It has been shown by Hora and many workers that the presence or absence of the barbels is not a binding criterion and it is a variable character.

Systemous unimaculatus Blyth is known by a number of fry upto 40 mm in length from the Sittang river, Burma. Day (1889) considered them akin to *P. thermalis*. *P. unimaculatus* is without any barbels similar to *P. thermalis* which has already been synonymised under *chola*. I see no reason for retaining this species especially when all the characters intergrade with the widely distributed *P. chola*

Additional Data :

TL/Head length	20.00 to 33.33	N = 25
TL/Body depth	29.67 to 40.32	N = 25
SL/Pre dorsal	49.07 to 55.65	N = 25
SL/Pre anal	66.84 to 76.76	N = 25
SL/Pre pelvic	48.15 to 53.52	N = 25
LH/LCPD	61.90 to 71.42	N = 25
LH/HCPD	43.33 to 57.14	N = 25
LH/Dorsal fin base	63.46 to 73.80	N = 23
LH/Width of Mouth	19.05 to 23.80	N = 23

***Puntius parrah* Day**

Puntius parrah Day, Proc. zool. Soc. Lond., p.301, 1865 (type locality, Kariavanoor river, Trichur, Kerala). - Day, Fish. Malabar, p.211, pl.7, fig.3, 1865. - Day, Fish. India, p.572, pl.142, fig.3, 1878. - Day, Fauna Brit. India Fish., 1, p.317, 1889. - Hora & Misra, J. Bombay nat. Hist. Soc., 39(3) p.518, 1937 (Dar na river, Deolali). - Hora & Misra, J. Bombay nat. Hist. Soc., 40(1), p.22, 1938 (Deolali).

Barbus (Puntius) parrah, xuyora, Rec. Indian Mus., 38(1), p.1 1936 (Chitaldrug dist., Karnataka). - Hora & Law,

Rec. Indian Mus., 43(2), p.237, 1941 (name only, distribution).- Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (name only, Coorg, Wynaad, Nilgiris).

Puntius parrah, Jayaram, *Handbk. FW. Fish. India*, p.101 (distribution), p.107 (key), 1981.- Jayaram, *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.61, 1982 (key, Cauvery river, S. India, variations).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.37, 1984 (common & vernacular names)

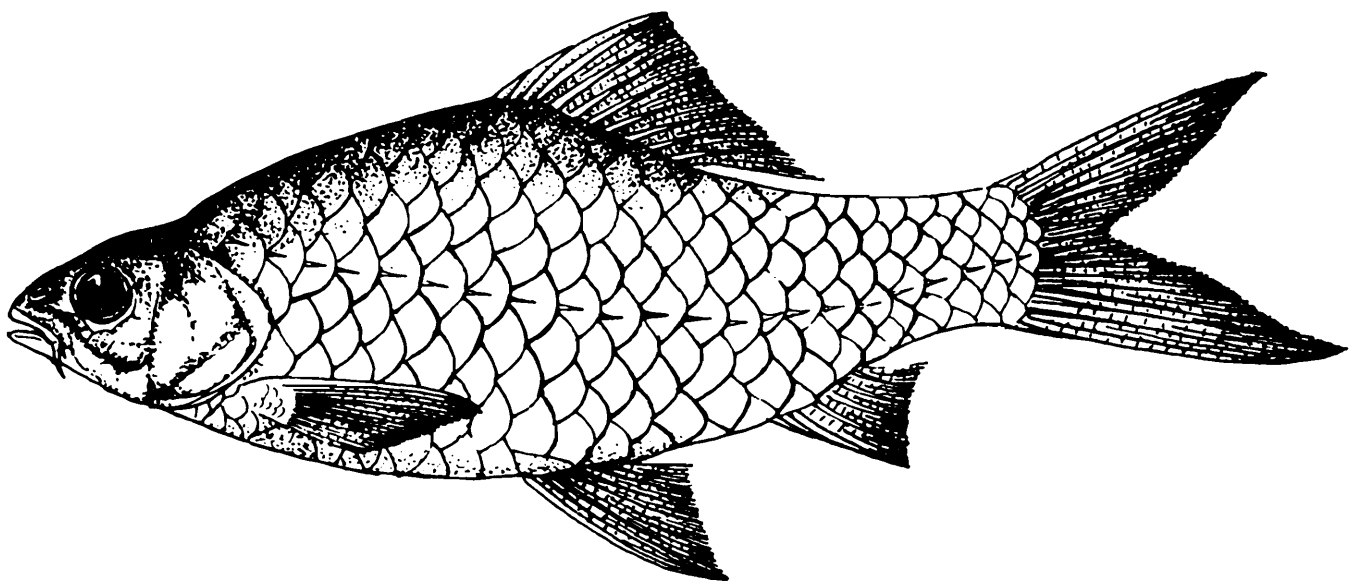
Vernacular Names : *Parrah perlee* Mal., *Ticker* Pun.

Specimens Studied : ZSI, SRS, Unreg. 8 exs., 71.5 to 94 mm SL, Cauvery river at Chunchinagatte, near K.R. Nagar, Karnataka State, K.C.J. Coll., 8.5.77.

ZSI 2718 Syn type, Purchased from F. Day, Kariavanoor river, Kerala.

Diagnosis : A moderately deep bodied fish with a pair of maxillary barbels, dorsal ray osseous, smooth 8 to 10 rows of scales before dorsal fin, complete lateral line, $2\frac{1}{2}$ to $3\frac{1}{2}$ scales between LL and pelvic fin and with a dark blue horizontal line on body.

Description : D. III, 8; P. 15; V 9; A. iii, 5; C. 19; LL. 25 or 26.



Lateral view of *P. parrah*

Dorsal and ventral profiles equally arched. Head short, bluntly rounded. Head 26.67 to 30.76, body depth 31.91 to 41.61 in percent of standard length. Head width 43.63 to 60.00, height of head at occiput 70.37 to 82.00, snout 26.92 to 34.09 in percent of head length. Snout obtuse, plain. Eyes in middle of head, 20.00 to 31.25 in percent of head length, 55.55 to 87.50 in percent of interorbital width and 70.58 to 107.14 of snout length. Mouth subterminal, its width less than internostril distance. Lips thin, plain. One pair of barbels.

Dorsal fin inserted midway between tip of snout and caudal base. Last unbranched dorsal ray osseous, weak in juveniles but becoming strong with growth. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 66.66 to 84.61 percent of its length. Lateral line complete.

Scales :	PDS 8 to 10; Pre-anal 12 to 14; Pre-pelvic 5 to 7
	Between LL and dorsal fin base $4\frac{1}{2} - 5\frac{1}{2}$
	Between LL and pelvic fin base $2\frac{1}{2} - 3\frac{1}{2}$
	Between LL and anal fin base $3\frac{1}{2} - 4$
	Circumpeduncular 10 or 11

Gill Rakers : 6 to 8 + 12 to 15

Size : Maximum 122 mm TL

Colour : Greenish on back, divided from the silvery abdomen by a dark bluish line. Cheeks golden red. Pectoral, pelvic and anal tinged with yellow. Dorsal and caudal dusky. A diffused black spot on the lateral line extending from the 20 to 22nd scale. Eyes golden.

Distribution : INDIA: Kerala, Tamil Nadu, Karnataka, extending upto south Maharashtra.

Relationship : Related to *P. chola* differing from it in colouration and scale counts.

Remarks : Holotype, B17NH, London. Syntype, ZSI. F.2718.

Day (1865) described *Puntius parrah* and *P. perlee* as two separate species. The two were differentiatedly the former having the body depth four-elevenths of the standard length unlike the latter with one half. Evidently Day thought that *perlee* is a different species with a deeper body. Gunther (1868) having examined the typical examples presented by Day to the British Museum stated that they do not agree with the descriptions given by Day. He considered *perlee* as synonymous with *parrah* but doubted whether the examples labelled by Day as *parrah* really belonged to that species as described by him. He opined that it may represent a distinct species not recognised by Day and which he did not name. I have examined only the Syntype of *P. parrah*. ZSI 2718 purchased from F. Day and this agrees in all respects with other material collected from the Cauvery river system, and also with the range of body depth of *perlee*.

Additional Data :

TL/Head length	21.55 to 24.76	N = 8
TL/Body depth	24.59 to 31.73	N = 8
SL/Pre-dorsal	49.71 to 53.33	N = 9
SL/Pre-anal	67.55 to 75.52	N = 9
SL/Pre-pelvic	46.27 to 51.08	N = 9
LH/Mouth width	16.00 to 24.00	N = 9
LH/LCPD	59.09 to 75.00	N = 9
LH/HCPD	44.44 to 54.00	N = 9
LH/Dorsal fin base	58.00 to 72.92	N = 9

Puntius burmanicus (Day)

Barbus burmanicus Day, *Fish. India*, p.572, pl.141, fig.4, 1878 (type locality, Mergui, Burma).- Day, *Fauna Brit. India. Fish.*, p.318, 1889.- Vinciguerra, *Ann. Mus. Civ. stor. nat. Genoa*, (2) 9, p.295, 1889.- Prashad & Mukerji, *Rec. Indian. Mus.*, 31, p.201, 1929 (Hopin, Myitkyina dist., Burma).- Hora & Law, *Rec. Indian Mus.*, 43 p.237, 1941 (name only; "Travancore, Burma and Malaya").- Hora, *Proc. nat. Inst. Sci. India*, 10(4) p.425, 1944 (name only).- Venkateswarlu & Rama Rao, *Occ. Paper zool. Surv. India*, No.87, p.13, 1986 (synonym of *P. dorsalis*)

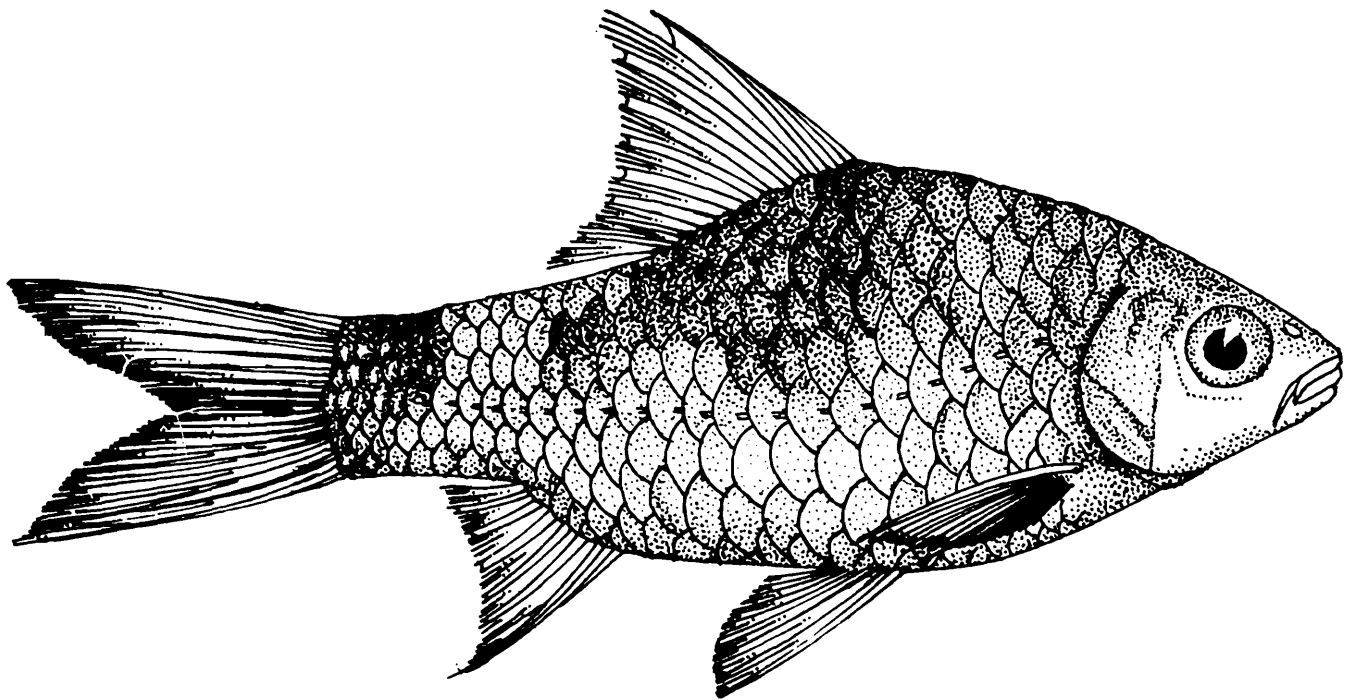
Puntius burmanicus, Jayaram, *Handbk. FW. Fish. India*, p.99 (distribution), p.107 (key), 1981.

Vernacular Names NIL

Specimens Studied : BMNH 1894.5.21. 46-55, 14 exs., 58.0 to 131.0 mm SL, Toungoo, Burma, E.W.Coates Coll.

Diagnosis A deep bodied fish with scales shining silvery, dorsal spine strong, osseous, smooth, lateral line complete with 23 to 28 scales (23-25 more common).

Description : D. I-II,7 or 8; P. 14-16; V i,8; A. i-ii,5-6; C. 15-17; LL. 23-28.



Lateral view of *P. burmanicus*

Dorsal and ventral profiles deeply arched. Head short, conical. Head length 26.04 to 31.85, body depth 40.16 to 44.85 in percent of standard length. Head width 40.54 to 55.71, height of head at occiput 67.56 to 76.31. snout 26.23 to 37.04 in percent of head length. Snout pointed. Eyes superior, large 23.81 to 31.03 in percent of head length, 55.55 to 100.00 in percent of interorbital width and 70.00 to 100.00 of snout length. Mouth subterminal, its width less than inter-nostril distance. Lips thin, plain. A short single pair of barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray osseous strong, smooth, short. Dorsal fin base greater than least depth of caudal peduncle.

Pectoral fins do not extend to pelvics; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 64.28 to 91.67 in percent of its length. Lateral line complete.

Scales : PDS 7 to 9; Pre-anal 11 to 14; Pre-pelvic 6 of 7

Between LL and dorsal fin base	4 $\frac{1}{2}$ to 5 $\frac{1}{2}$
Between LL and pelvic fin base	2 $\frac{1}{2}$ to 3 $\frac{1}{2}$
Between LL and anal fin base	2 $\frac{1}{2}$ to 3 $\frac{1}{2}$
Circumpeduncular	10 or 11

Gill Rakers : 3 to 6 + 15 to 17

Size : 155 mm TL.

Colour : Silvery along the back becoming lighter on the sides and beneath; a dull blotch at base of caudal fin; scales below dorsal fin darker, but generally silvery, shining in preserved examples with blotch at caudal base inconspicuous.

Distribution : Burma: Mergui Malaya. Hora & Law's (1941) citation of Travancore needs confirmation.

Relationships : Closely related to *P. chola* differing from it in having shorter barbels, brighter colouration and squamation.

Additional Data :

TL/Head length	21.59 to 31.74	N = 7
TL/Body depth	31.16 to 31.78	N = 7
SL/Pre dorsal	50.05 to 56.08	N = 14
SL/Pre pelvic	48.09 to 53.03	N = 14
SL/Pre anal	71.66 to 78.37	N = 14
LH/Dorsal fin base	60.00 to 74.28	N = 11
LH/LCPD	58.33 to 75.67	N = 13
LH/HCPD	46.55 to 67.56	N = 14
LH/Width of mouth	18.18 to 25.14	N = 14

The "*amphibius*" Complex

Species :

1. *P. amphibius* (Valenciennes), 1842, p.478.
2. *P. dorsalis* (Jerdon), 1849, p.314.
3. *P. cauveriensis* (Hora), 1937, p. 20.

Common Characters :

1. Barbels two.
2. Ossified, smooth dorsal spine.
3. Lateral line complete.
4. Lateral line scales 21 to 28.
5. PDS 7 to 9.
6. LL/Dorsal 4 to 5 $\frac{1}{2}$ scales.
7. LL/Pelvic 2 $\frac{1}{2}$ to 3 $\frac{1}{2}$.
8. Pre anal scales 5 to 7

***Puntius amphibius* (Valenciennes)**

Capoeta amphibia Valenciennes, *Hist. Nat. Poiss.*, 16, p.282, pl.478 (fig. not good) 1842 (type locality, Bombay).- Bleeker, *Verh. Bat. Gen.*, 25, p.62, 1853.

Systomus amphibius, Jerdon, *Madras J. Lit. & Sci.*, p.315, 1849.

Puntius hamiltonii Day, *Fish. Malabar*, p.213, 1865.

Barbus amphibius, Gunther, *Cat. Fish. Brit. Mus.*, p.144, 1863(Bombay). Day, *Proc. Zool. Soc. Lond.*, p.373, 1870.- Day, *Fish. India*, p.574, pl.142, fig.8, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.322, 1889.- Jenkins, *Rec. Indian Mus.*, 5, p.135 (name only, Barkuda Isls, Chilka) p.136 (not represented in Satpara), 1910.- Raj, *Rec. Indian Mus.*, 12, pp.251, 257, 1916 (Madras).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 39(3), pp.510,512, 515, 517, 1937 (Poona).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 40(1), p.22, 1938(Deolali).- Hora, *Rec. Indian Mus.*, 40(3), p.238 (name only; Timinar at foot of Bailadila range, M.P.).- Hora & Law, *Rec. Indian Mus.*, 43(2), p.235, 1941 (name only).- David, *Proc. nat. Inst. Sci. India*, 22B(3), p.152, 1956 (Bhadra river at Bhadravati).

Puntius amphibius, Hora, *J. Zool. Soc. India*, 1(1), p.2, 1949 (Rihand river).- Deraniyagala, *Spolia Zeylanica*, 16(1), p.15, 1930 (description, distribution in Sri Lanka). -Herre, *Spolia Zeylanica*, 24(3), p.175, 1946 (Colombo, Peradeniya, Sri Lanka).- Silas, *Bull. Natnl. Inst. Sci. India*, 7, p.251, 1952 (name only; Sri Lanka).- Chauhan & Ramakrishna, *Rec. Indian Mus.*, 51, p.403, 1953 (Tel river, Balangir Dist., Orissa).- Silas, *Rec. Indian Mus.*, 51 (1), p.28, 1953 (name only, Tambraparni River).- Munroe, *Marine & FW fish Ceylon*, p.44, 1955 (Synonymy, diagnosis, distribution in Sri Lanka).- Rajan, *J. Bombay nat. Hist. Soc.*, 53(1), 1955 (name only, Bhavani and Moyar rivers, Nilgiri Hills).- Motwani & David, *J. zool. Soc. India*, 9(1), p.11, 1957 (Sone river, Bihar).- Karamchandani, *Tropical Ecology*, 3(1 & 2) p.80, 1962 (R. Ganga at Dighwara, Bihar).- Misra, *Rec. Indian Mus.*, 57(1_4), p.151, 1962 (brief description; specific name spelt '*amphibia*').- Datta & Majumdar, *Rec. zool. Surv. India*, 62, (1&2), p.87, 1970 (Jhalwar, Udaipur Districts, Rajasthan, specific name spelt "*amphibia*").- Venkateswarlu, *Indian J. Zootomy*, 13(3), p.122, 1972 (name only, Bihar).- Venkateswarlu, *Acta Ichthyol. Piscatoria*, 2(2) p.95, 1972 (abnormal example from Patna, specific name spelt "*amphibia*").- Mathur & Yazdani, *Sci. & Cult.*, 39, p.88, 1973 (recorded from Jakhat Sagar & Kailana lake, Jodhpur, specific name spelt "*amphibia*").- Tilak, *Rec. zool. Surv. India*, 67(1-4) p.94, 1973 (Goa, Ponda, Colva road).- Venkateswarlu, *Acta Ichthyol. Piscatoria*, 6(1), p.91, 1976 (River Poonpun, Ganga, Ganderele near Patna).- Jayaram et al, *Bull Madras Govt. Fish. Dept.*, 7, p.3, 1976 (Cardamom hills Variations). Venkateswarlu, *Acta Ichthyol. Piscatoria*, 7(1), p.49, 1977 (R. Poonpun).- Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*, 9(1) p.52, 1979 (name only, list of Ganga fishes, spelling "*amphibia*").- Jayaram, *Handbk. FW. Fish. India*, p.99 (distribution), p.108 (key), 1981.- Jayaram, et al. *Occ. Paper zool. Surv. India*, No.36, p.51, 1982 (key, Cauvery River, S. India).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.36, 1984 (common & vernacular names).

Barbus (Puntius) amphibius, Hora & Law, *Rec. Indian Mus.*, 43 p.244, 1941 (Manimala river, Peruntenaruvi, Kallada river Kulathupuzha, Chittar, Central kerala).- Hora, *Rec. Indian Mus.*, 44, p.194, 1942 (name only, Karnataka). -Hora, & Misra, *J. Bombay nat. Hist. Soc.*, 43(1), p.220, 942 (Poona).- Hora, *J. zool. Soc. India*,

1(1), p.4, Tf.2 (map), 1949 (Rihand river, U.P.).- Silas, *J. Bombay nat. Hist. Soc.*, 49(4), p.674, 1951 (Valpara, Ponnani drainage, Kerala).- Hora, *J. Bombay nat. Hist. Soc.*, 51, p. 185, 1952 (distribution map).- Silas, *J. zool. Soc. India*, 3(1), p.7, 1951 (head waters of Cauvery, Coorg),- Job, David & Das, *Indian, J. Fish.*, 2(1), p.33, 1955 (Mahanadi below Hirakud Dam).

Vernacular Names : *Colee Berlee*, *Urulen kendai*, Mal; *Bhondgi*, *Khavil*, Mar; *Guldi*, Ori; *Kulla kendai*, *Numbriti kendai*, Tam.

Specimens Studied : ZSI, SRS unreg. 234 exs, from different localities of the Cauvery river, 33 to 88 mm SL, KCJ Coll. 1973, 1974, 1977 ZSI FF.167, 10 exs, 23 to 67 mm SL Rihand river near Dam Site, U.P. HA Hafiz coll. 27.7.47. ZSI F. 1847/2, 1 ex., 102 mm SL Karwar, N. Kanara, K.K. Tiwari coll.

ZSI F.967, 4 exs., 73 to 88 mm SL, Mahanadi river near Tikarpara, M.P. Survey.

ZSI F..1847/2, 2 exs., 74.0 to 82.0 mm SL, Karwar, K.K. Tiwari Coll 2.21950.

ZSI F.2792/2, 2 exs., 52.0 & 57.0 mm SL., surroundings of Novagoa, 21.10.1940.

ZSI F.5584/1, 1 ex., 74.5 mm SL, Bombay, F. Day coll.

ZSI F.2725/1., 1 ex., 84 mm SL., Bombay, F.Day coll.

ZSI F.12549/1, 5 exs., 33.0 to 35.5 mm SL., Aounda river, Lake Beale, Maharashtra, A.G.L. Fraser Coll. 6.10.1935.

ZSIF.12548/1, 1 ex., 59.5 mm SL., Aounda river, West of road bridge between Aswali Railway Station and Lake Beale, Maharashtra, A.G.L. Fraser Coll. 24.2.1936.

ZSI F.2515/2, 4 exs., 32.5 to 41.0 mm SL., Medha, Satara Dist., Maharashtra, S.P. Agharkar Coll. 25.10.1912.

Diagnosis : An elongated fish with a pair of thin barbels, dorsal ray feebly osseous, mostly appearing as non-osseous, lateral line complete with $2\frac{1}{2}$ scales between it and pelvic fin base. A conspicuous dark spot at base of caudal fin present.

Description : D. II-III, 7-9; P. i-ii, 11-12; V i, 7-8; A.ii-iii, 5; C. 15-17; LL. 21-28 (normally 24-25).

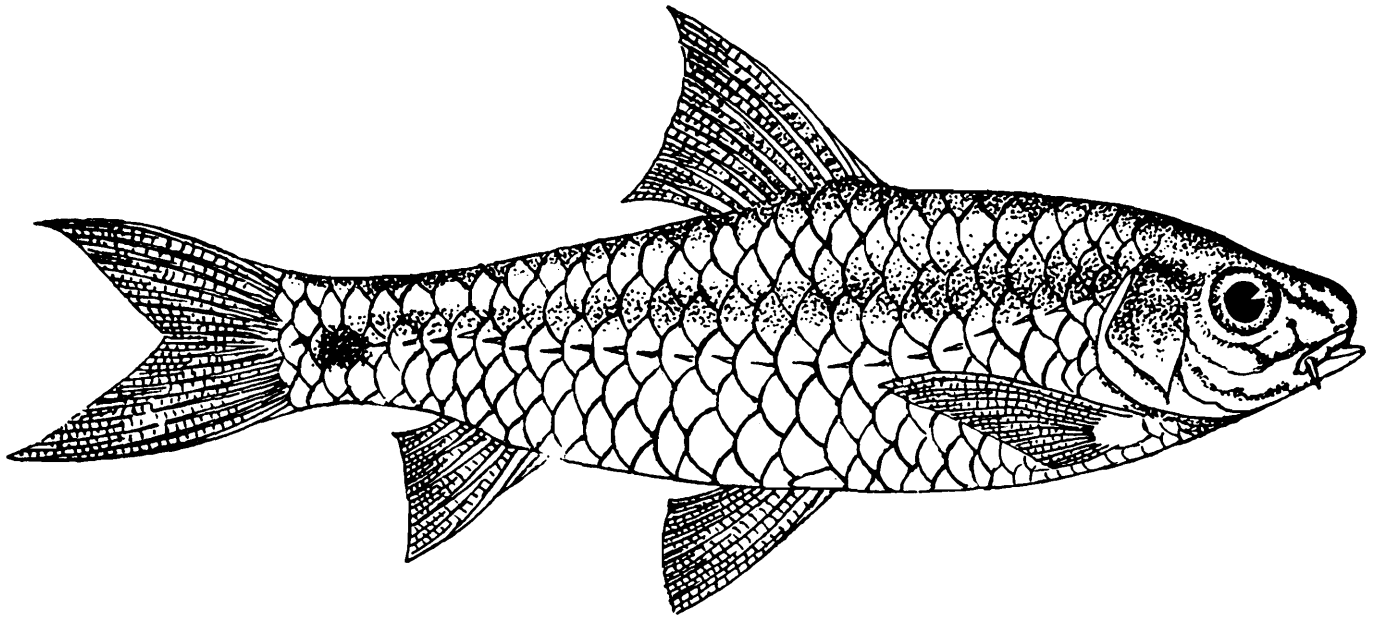
Dorsal profile gently sloping, ventral profile more steep. Head moderate, blunt. Head length 26.58 to 33.33, body depth 25.00 to 33.85 in percent of standard length. Head width 33.33 to 58.54, height of head at occiput 63.64 to 75.00, snout 39.62 to 45.00 in percent of head length. Snout blunt, plain. Eyes superior, 24.39 to 33.33 in percent of head length, 66.67 to 100.00 in percent of interorbital width and 66.67 to 100.00 in snout length. Mouth subterminal, its width equal to or less than inter-nostril distance. Lips thin, plain. A pair of maxillary barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray feebly osseous, mostly appearing as non-osseous, smooth. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 62.50 to 75.00 in its length. Lateral line complete.

Scales : PDS 7-9 (mostly 8); Pre-pelvic 6-7; Pre-anal 13-14.

Between LL and dorsal fin base 4 - $4\frac{1}{2}$

Between LL and pelvic fin base	$2\frac{1}{2}$
Between LL and anal fin base	$2\frac{1}{2} - 3\frac{1}{2}$
Circumpeduncular	10 or 11



Lateral view of *P. amphibius*

Gill Rakers 6 + 15

Size : Maximum 90mm TL

Colour : Upper half of body dark blue, becoming pale beneath. A dark spot at base of caudal fin invariably present, the intensity of colour depending upon the extent of freshness and preservation.

Distribution : INDIA: Rajasthan, Uttar Pradesh, Bihar, Goa, Maharashtra, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Madhya Pradesh and Orissa. Sri Lanka.

Relationship Very close to *P. dorsalis* from which it is chiefly differentiated by its weak dorsal spine, absence of spots on dorsal and anal fins. Further *P. dorsalis* has invariably iv, 8 dorsal fin rays unlike *amphibius* (iii, 7, iii, 9). For further differences see Table on, page 66.

Remarks : A very common species in Southern India.

Additional Data :

TL/Head LENGTH	20.13 to 23.33	N = 33
TL/Body depth	20.00 to 24.61	N = 33
SL/Pre dorsal	47.56 to 53.85	N = 46
SL/Pre anal	70.45 to 78.79	N = 46
SL/Pre pelvic	41.77 to 57.57	N = 46

LH/Mouth width	16.67 to 26.67	N = 44
LH/LCPD	54.54 to 75.00	N = 45
LH/HCPD	37.04 to 55.55	N = 46
LH/Dorsal fin base	41.67 to 68.29	N = 41

Puntius dorsalis (Jerdon)

Systemus dorsalis Jerdon, *Madras J. Lit. & Sci.*, pp.314, 1849 (type locality, tanks and rivers in the neighbourhood of Madras).

Systemus tristis Jerdon, *Madras J. Lit. & Sci.*, p.316 1849 (type locality, River Cauvery).- Hora, *Rec. Indian Mus.*, 38, p.5, 1936 (considered distinct from *dorsalis*).

Barbus dorsalis, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.142, 1868.- Day, *Fish. India*, p.573, pl.142, fig.2, 1878 (Kumool, Mysore, throughout Madras as low as Cauvery, Coleroon and Sri Lanka).- Day, *Fauna Brit. India. Fish.*, 1, p.319, 1889.- Raj, *Rec. Indian Mus.*, 12, pp.251, 255, 1916 (Madras).- Hora, *Rec. Indian Mus.*, 38, p.2, text fig. 1,2, 1936 (synonymy, variations discussed).- Hora, *Rec. Indian Mus.*, p.16 (Sagar, Shimoga dist.), 17 (Tunga river, Shimoga), 19 (Cauvery river, Coorg), 1937.- Chacko, Krishnamurthi & George, *Contrib. FW. fisheries Biol. Sin. Madras*, No.3 p.3, 1952 (Kannigiri-Duvvur reservoir, Pennar, Andhra Pradesh).- David, *Proc. nat. Inst. Sci. India*, 22B(3), p.153, 1956 (Bhadra river at Bhadravati).

Barbus tetraspilus Gunther, *Cat. Fish. Brit. Mus.*, 7, p.142, 1868 (Sri Lanka).- Hora, *Rec. Indian Mus.*, 38, p.4, 1936 (synonymy with *dorsalis* justified).

Barbus layardi Gunther, *Cat. Fish. Brit. Mus.*, 7, p.144, 1868 (Sri Lanka).- Hora, *Rec. Indian Mus.*, 38, p.5, 1936 (considered distinct from *dorsalis*).

Puntius (Capoeta) puckelli Day, *Proc. zool. Soc. Lond.*, p.197, 1868 (type locality, Bangalore).- Day, *Fish. India*, p.574, pl.143, fig.5, 1878.- Day, *Fauna Brit. India Fish.*, 1, p.321, 1889.- Hora, *Rec. Indian Mus.*, 38, p.4, 1936 (synonymised with *dorsalis*).

Barbus puckelli Day, *Fish. India*, p.574, pl.142, fig.2, 1878.- Day, *Fauna Brit. India*, 1, p.321, 1889.- Hora, *Rec. Indian Mus.*, 38, p.2, 1936 (synonymised with *dorsalis*).- Venkateswarlu & Rama Rao, *Occ. Paper zool. Surv. India*, No. 87, p.13, 1986 (synonym of *dorsalis*).

Barbus (Puntius) dorsalis Hora, *Rec. Indian Mus.*, 38, p.2,3,4,1936 (Chitaldrug dist., Karnataka; synonymy, variations discussed).- Misra, *Rec. Indian Mus.*, 40, p.258, 1938 (Kodur, Cheyyuru river, Palkonda, Nallamali hills, E. ghats).- Hora, *Rec. Indian Mus.*, 42, p.371, 1940 (Raipur dist., M.P.).- Hora & Nair, *Rec. Indian Mus.*, 43(3), p.364 (Pachmarhi), p.365 (Singanama, Itarsi), p.367 (Harda), 1941.- Hora, *Rec. Indian Mus.*, 44, p.195, 1942 (name only, distribution).- Silas, *J. Bombay nat. Hist. Soc.*, 49(4), p.674, 1951 (Vannamadi Bridge, Anaimalai hills, Ponnani drainage, Kerala).- Job, David & Das, *Indian J. Fish.*, 2(1), p.33, 1955 (Mahanadi below Hirakud Dam).

Puntius dorsalis, Deraniyagala, *Spolia Zeylanica*, 16(1), p.12, 1930 (description, distribution in Sri Lanka).- Herre, *Spolia Zeylanica*, 24(3), p.175, 1946 (Colombo, Galatabendiyaya, Peradeniya, Telulla, Sri Lanka).- Silas, *Bull. Nat. Inst. Sci. India*, No.7, p.251, 1952 (name only, Sri Lanka).- Munroe, *Marine & FW. Fish. Ceylon*, p.43, 1955 (synonymy, brief diagnosis, distribution in Sri Lanka).- Rajan, *J. Bombay nat. Hist. Soc.*, 53(1), p.45, 1955 (name only, Bhavani and Moyar rivers, Nilgiris).- Dutta Gupta *et al.*, *Proc. Rajasthan Acad. Sci.*, 8(1 & 2), p.1961 (Jaipur, Udaipur, Jhunjhunu districts, Rajasthan).- Menon, *Rec. zool. Surv. India*, 59(4), p.379, 1966 (Karaikal, Veeranam Lake, Ponnaiyar river at Madukkarai).- Jayaram *et al.*, *Bull. Madras Govt. Fisheries. dept.*, 7, p.4, 1976 (Cardamom hills, Variations).- Jayaram, *Handbk. FW. Fish. India*, p.100. (distribution), p.107 (key), 1981.- Jayaram, *et al.*, *Occ. Paper Zool Surv. India*, No. 36, p.56, 1982 (Key, Cauvery river, S. India. relationship with *amphibius* No.56, p.37, 1984 (common & vernacular names)).

Vernacular Names : Marpakka, Kan; Pal pooran Kendai, Sale Kendai, Moorkanam Kendai, Tam

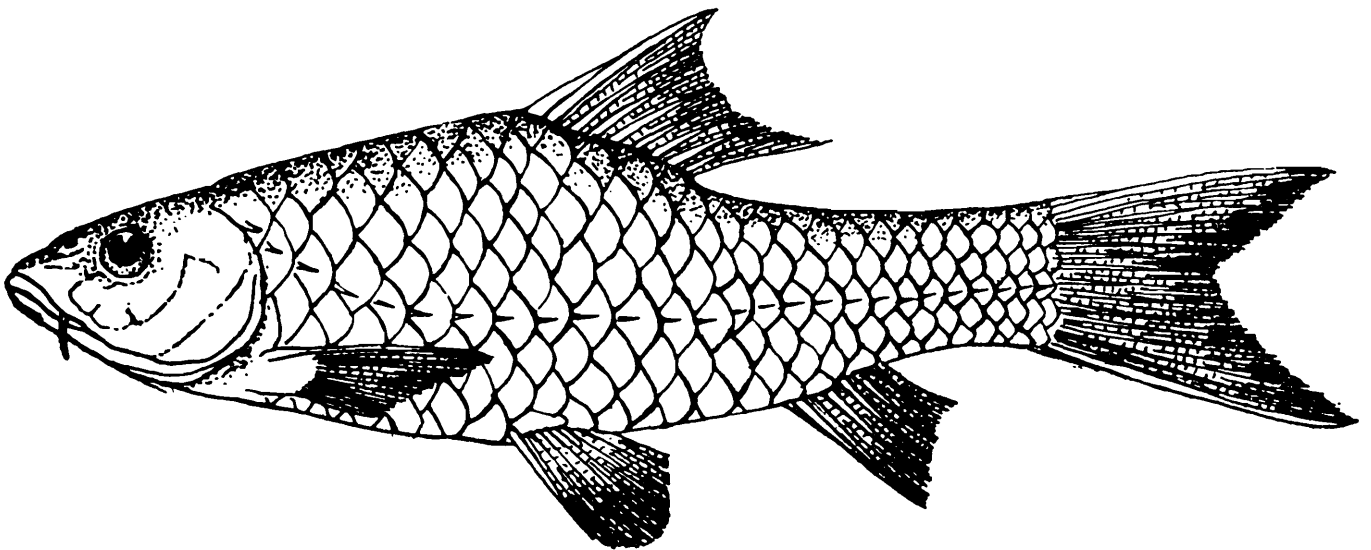
Specimens Studied : ZSI, SRS, unreg. 137 examples from River Cauvery, 43.0 to 125 mm SL, KCJ Coll. 1973, 1974, 1977

ZSI, F.12319/1, 5 exs., 39.5 to 58.0 mm SL, Cauvery river, Coorg, C.R.Narayan Rao Coll.

ZSI, F.12320/1, 1 ex., 55.0 mm SL., Tunga river at Shimoga, H.S.Rao Coll.

Diagnosis :-A long fish with two barbels, last unbranched dorsal ray osseous, strong, smooth, lateral line complete. $2\frac{1}{2}$ scales between LL and pelvic fin base and 22-28 (mostly 25 or 26) scales along lateral line.

Description : D. I-II, 8; P.15-16; V.I, 7-8; A. i-ii, 5-7; C.17; LL.22-28 (normally 25 or 26).



Lateral view of *P. dorsalis*

Dorsal profile gently rising, ventral profile nearly straight. Head small, conical. Head length 26.04 to 31.82; body depth 30.77 to 34.48 in percent of standard length. Head width 42.42 to 58.33; height of head at occiput 63.64 to 78.95; snout 31.82 to 37.14 in percent of head length. Snout long, pointed, plain. Eyes moderate, 21.05 to 32.26 in percent of head length, 57.69 to 100.00 in percent of inter-orbital width and 57.69 to 100.00 of snout length. Mouth subterminal, crescentic, its width less than inter-nostril distance. Lips thin, plain. A single pair of maxillary barbels.

Dorsal fin inserted nearer caudal fin base than tip of snout. Last unbranched dorsal ray osseous, strong, smooth. Dorsal fin base greater than least height of caudal peduncle. Pectoral fins may or may not extend to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least height of caudal peduncle 58.82 to 76.47 in percent of its length. Lateral line complete.

Scales : PDS 8 or 9 (mostly 9); Pre-pelvic 5 or 6; Pre-anal 11-13.

Between LL and dorsal fin base $4\frac{1}{2} - 5\frac{1}{2}$

Between LL and pelvic fin base $2\frac{1}{2}$

Between LL and anal fin base	$3\frac{1}{2}$
Circumpeduncular	9 or 10

Gill Rakers : 6 - 7 + 10 - 13

Size : Maximum 140 to 150 mm TL.

Colour : In life olive dorsally, silvery on sides, body whitish, fins orange. A black blotch on tail present but disappears after death. In immature specimens a well marked black lateral band extending from the shoulder along the lateral line to the caudal blotch may be present. Occasionally the posterior half of the basal sheath of the dorsal fin is also black, and often the upper and lower margins of the caudal are dark. In alcohol preserved examples uniformly dull brown, pale beneath.

Distribution : INDIA : Cauvery, Krishna River systems, Kerala, Karnataka, Andhra Pradesh, Mahanadi in Orissa, Narmada in Hoshangabad dist., M.P. Record from Rajasthan needs verification. Sri Lanka.

Relationship : Closely allied to *P. amphibius* differentiated from it by the stouter dorsal spine, lateral line with 25-26 scales (vs. 24-25), and dorsal fin rays iv. 8, (vs. iii. 7-9). A comparison is presented below.

Characters	<i>P. amphibius</i>	<i>P. dorsalis</i>	<i>P. cauveriensis</i>
1. Scales between LL/Pelvic	$2\frac{1}{2}$	$2\frac{1}{2}$	$3\frac{1}{2}$
2. LL/Dorsal	4- $4\frac{1}{2}$	$4\frac{1}{2}$ - $5\frac{1}{2}$	4- $5\frac{1}{2}$
3. LL	24-25 (common)	25-26 (common)	23-27
4. Dorsal spine	Weak	Strong	Strong
5. Dorsal fin	III, 7-9	IV, 8	II-III, 8-9
6. Spots in dorsal and anal fins	Absent	Present	Absent
7. Folds of skin on cheeks	Absent	Absent	Present
8. LH/Snout	2.22-2.52	2.69-3.14	2.54-3.25

Remarks : Hora (1936) dealt at length the colour variations of this species associated with growth. According to him in very young specimens of 23 mm total length a deep black spot on the basal portion of the posterior dorsal rays, a second similar spot at the base of the caudal fin and a third one at the base of the posterior anal rays are present. Further the bases and margins of scales, especially in the dorsal region are covered with minute, irregularly scattered small black dots. The dorsal spine is also reported to be very weak at this stage. With the growth of the fish, the anal spot disappears, the scale markings become prominent, while the dorsal and caudal spots persist in a fairly well marked condition in specimens upto 83 mm in length, though they may be reduced and become lighter in colour. The dorsal spine is still weak.

These variations are not very wide spread as later shown by Hora himself (1940), when dealing with Mahanadi samples. Compared to *P. amphibius* the dorsal spine in *P. dorsalis* is strong in all size and age groups. Moreover, the caudal spot is more prominent in *amphibius* than in *dorsalis*. Further, the long, pointed snout of *dorsalis* is very diagnostic.

Day (1868) described *Puntius puckelli* from Bangalore. Hora (1936) after examining several examples from Chitaldurg district, Karnataka, thought that *puckelli* is only a juvenile of *dorsalis*. The colour markings by which *puckelli* is characterised fall within the range of variation of *dorsalis*, and hence the synonymy of *puckelli* is justified.

Hora (1936) considered that *Barbus layardi* Gunther and *Systomus tristis* Jerdon are not conspecific with *dorsalis*. Here also Hora erroneously laid much stress on the colour marking, specially the dorsal and caudal spots, and on this basis considered these as separate species, although *tristis* is inadequately described as mentioned by Hora also. It has been stated elsewhere that the true diagnostic features of *dorsalis* lie in its scale counts and other data (see table, p.61) than the colour markings which are highly variable from locality to locality and season to season, besides size. Hence *layardi* and *tristis* are synonymised under *dorsalis* justifiably.

Mention may be made here that *Leuciscus binotatus* Blyth, 1858 from Sri Lanka which is a synonym of this species is different from *Barbus (Puntius) binotatus* Valenciennes, 1842 from Java which is a senior synonym of *Systomus (Barbodes) goniosoma* Bleeker, 1860 from Burma.

Frequency distribution of Lateral line Scales and Pre dorsal Scales in *P. amphibius* and *P. dorsalis*

	Lateral Line Scales								Pre dorsal Scales		
	21	22	23	24	25	26	27	28	7	8	9
<i>P. amphibius</i>	1	4	17	96	90	22	3	1	30	165	39
<i>P. dorsalis</i>	–	1	1	14	40	60	19	2	–	20	117

Additional Data :

TL/Head length	22.00 to 24.56	N=25
TL/Body depth	24.00 to 26.67	N=25
SL/Pre dorsal	49.09 to 58.44	N=25
SL/Pre anal	70.00 to 80.00	N=25
SL/Pre pelvic	47.06 to 54.14	N=25
LH/Mouth width	17.86 to 26.67	N=23
LH/LCPD	63.64 to 71.43	N=25
LH/HCPD	41.67 to 52.83	N=25
LH/Dorsal fin base	43.86 to 62.50	N=23

Puntius cauveriensis (Hora)

Barbus cauveriensis Hora, *Rec. Indian Mus.*, 39(1), p.20, 21, 1937 (type locality, Cauvery river, Coorg, Karnataka).- Menon & Yazdani, *Rec. zool. Surv. India*, 61(1 & 2), p.104, 1968 (Holotype in ZSI).

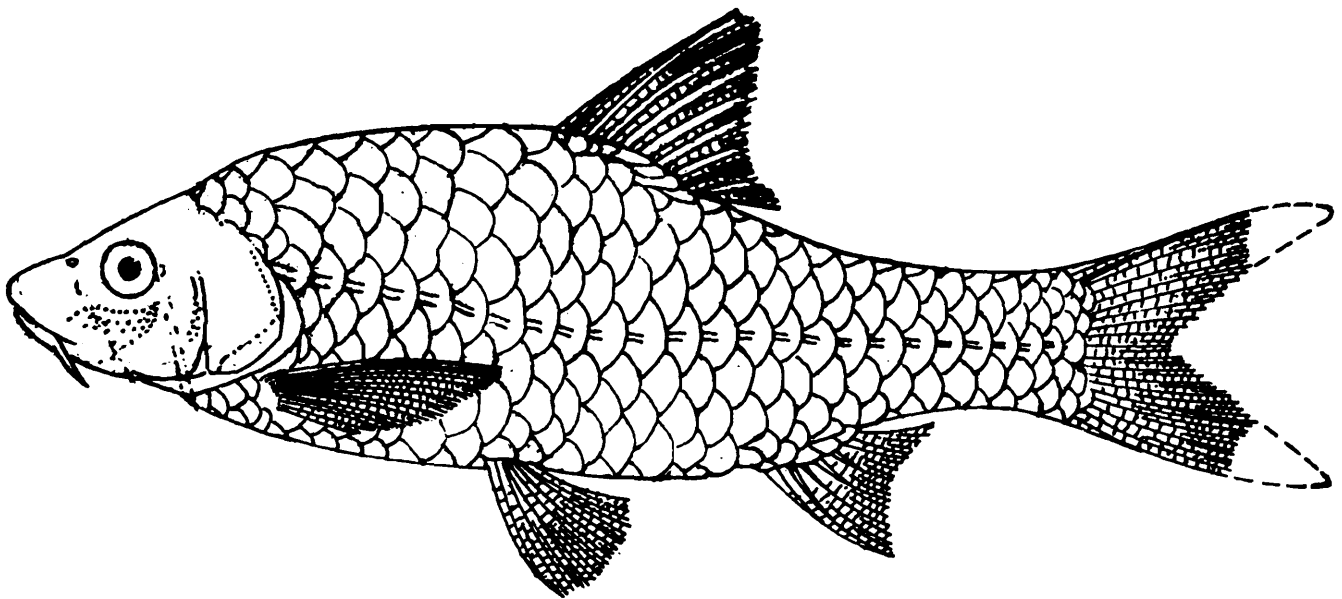
Puntius cauveriensis, Jayaram, *Handbk. FW. Fish. India*, p.99 (distribution), p.107 (key), 1981.- Jayaram *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.53, 1982 (key, Cauvery river, S. India, topotypes differences from *dorsalis* noted).

Vernacular Names : NIL

Specimens Studied : ZSI, F.12179/1, Holotype, 122 mm SL, Cauvery river, Coorg, C.R.N. Rao coll. ZSI, SRS Unreg. 6 exs., 98 to 118 mm SL, River Kannige, at Bhagamandala, Coorg dist., KCJ coll., 4.10.75. ZSI, SRS, Unreg. 1 ex., 132 mm SL from River Cauvery at Chunchanakatte, K.R. Nagar, Karnataka, KCJ coll., 8.5.77. ZSI, SRS, Unreg. 2 exs., 77 and 96 mm SL, Chitturpuzha at Tattamangalam, Palghat dist., Kerala, KCJ coll., 21.2.85. ZSI, SRS, Unreg. 1 ex., 91 mm SL, Malampuzha right canal, Palghat dist., Kerala, KCJ coll., 23.2.85.

Diagnosis : A deep bodied fish, plain coloured without any colour spots, with a pair of barbels, complete lateral line, a ossified smooth dorsal spine with $3\frac{1}{2}$ rows of scales between lateral line and pelvic base, a fleshy fold of skin on cheek and a title of rows of scales at dorsal fin base.

Distribution : D. II-III,8-9; P.15-16; V. 7; A.ii, 5-6; C. 18; LL. 23-27.



Lateral view of *P. cauveriensis*

Dorsal profile rising sharply to occiput, ventral profile evenly arched throughout. Head length 26.64 to 30.60; body depth 28.12 to 36.36 in percent of standard length. Head width 49.23 to 58.33; height of head at occiput 55.17 to 73.08; snout 30.77 to 38.89 in percent of head length. Snout pointed. Eyes small, 18.46 to 24.00 in percent of head length, 54.55 to 85.71 in percent of interorbital width, 53.85 to 75.00 of snout length. Mouth small,

somewhat oblique, sub-inferior, its width less than inter-nostril distance. Lips thick, somewhat papillated. A pair of maxillary barbels present.

Dorsal fin inserted almost midway between tip of snout and caudal base. Last unbranched dorsal ray well ossified and smooth. Dorsal fin base less than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 50.00 to 76.67 in percent of its length. Lateral line complete.

Scales : PDS 8-9; Pre-pelvic 5-7; Pre-anal 12-14

Between LL and dorsal fin base	4 - 5 ¹ / ₂
Between LL and Pelvic fin base	3 ¹ / ₂
Between LL and anal fin base	3 ¹ / ₂
Circumpeduncular	9-10

Gill Rakers : 5 or 6 + 19 to 21

Size : 118 mm TL

Colour : Greyish brown, without any spot or band on body.

Distribution : INDIA: Cauvery river, Erode, Tamil Nadu; Chunchanakatte, K.R.Nagar, Kannige river, Bhagamandala, Coorg, Karnataka; Palghat dist., Kerala.

Relationship : As already pointed out by Jayaram *et al.* (1982) this species is very closely allied to *P.dorsalis* from which it can be differentiated only by the presence of 3¹/₂ rows of scales below the lateral line and the pelvic fin base (vs. 2¹/₁ in *dorsalis*); the fleshy folds of skin on the cheek, and a tile like row of scales at the base of dorsal fin.

Remarks : The occurrence of this species in Palghat dist., Kerala is a new record.

Additional Data :

TL/Head length	21.27 to 29.87	N=7
TL/Body depth	21.43 to 23.08	N=7
SL/Pre dorsal	49.73 to 57.33	N=8
SL/Pre anal	67.70 to 75.43	N=8
SL/Pre pelvic	46.35 to 52.08	N=8
LH/Mouth width	17.24 to 21.15	N=8
LH/LCPD	68.18 to 81.48	N=8
LH/HCPD	39.65 to 53.85	N=8
LH/Dorsal fin base	47.88 to 67.31	N=8

The "*bimaculatus*" Complex

Species :

1. *P. bimaculatus* (Bleeker), 1864, p. 17.
2. *P. denisonii* (Day), 1865, p.299.

3. *P. melanostigma* (Day), 1878, p.573.
4. *P. arenatus* (Day), 1878, p.574.

Common Characters :

1. Barbels two.
2. Lateral line complet.
3. Lateral line scales 23 to 27.
4. PDS mostly 8 or 9 (rarely 10).
5. LL/Pelvic scales $2\frac{1}{2}$ to $3\frac{1}{2}$.
6. Circumpeduncular scales mostly 10 or 11 (rarely 9).
7. Dorsal fin base greater than least depth of Caudal peduncle.

***Puntius bimaculatus* (Bleeker)**

Gnathopogon bimaculatus Bleeker, *Verhand. Maatsch. Holl. Harlem. Cobitidae et Cyprinidae Ceylon*, P.17, pl.4, fig.1, 1864 (type locality, Sri Lanka).

Barbus bimaculatus, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.147, 1868 (Sri Lanka).

Puntius bimaculatus, Deraniyagala, *Spolia Zeylanica*, 16(1), p.16, 1930 (description, distribution in Sri Lanka).- Herre, *Spolia Zeylanica*, 24(3), p.175, 1946 (Galatabendiyaya, Peradeniya, Sri Lanka).- Silas, *Bull. Natl. Inst. Sci. India*, No.7, p.251, 1952 (name only, Sri Lanka).- Muroe, *Marine & FW. Fish Ceylon* p.44, 1955 (synonymy, brief diagnosis, distribution in Sri Lanka).- Jayaram, *Handbk. FW. Fish. India*. p.99 (distribution), p.107 (key), 1981.

Vernacular Names : *Ipilli kadeya*, Sinhalese.

Specimens Studied : BMNH. 1981.1.21. 1045 - 1052, 7 exs., 33.5 tp 45.5 mm SL, Sri Lanka, Schut Colln. ZSI, SRS F.697 1 ex., 42 mm SL, stream near Kodamadi estate, Kalakkad, Tamil Nadu, M. Vasanth Coll., 15.1.87.

Diagnosis : Very much like *P. dorsalis* with sharp snout, two barbels, dorsal ray weak, articulated, lateral line complete. A prominent caudal spot and another on dorsal fin base, scales bordered brown.

Description : D. I, 7 or 8; P, i, 12 to 15; V. i, 8; A. i-ii, 5; C. 16 to 18, LL. 23 or 24.

Dorsal profile more convex than ventral profile. Head long depressed. Head length 28.21 to 36.36, body depth 26.78 to 30.68 in percent of standard length. Head width 45.45 to 65.22, height of head at occiput 60.00 to 86.95, snout 27.27 to 30.77 in percent of head length. Snout plain, sharp. Eyes 23.08 to 30.77 in percent of head length 60.00 to 100.00 in percent of interorbital width and 75.00 to 100.00 of snout length. Mouth subterminal, its width less than least depth of caudal peduncle. Lips thin, plain. A single pair of barbels.

Dorsal fin inserted midway or slightly nearer tip of snout than caudal base. Last unbranched dorsal ray weak not osseous, articulated, smooth. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins do not extend to pelvics; latter not reaching anal opening. Anal fin when laid flat reaching root of caudal fin. Least depth of caudal peduncle 66.67 to 86.67 in percent of its length. Lateral line complete.

Scales :	PDS 8 or 9; Pre-anal 13 to 15; Pre-pelvic 6 or 7
	Between LL and dorsal fin base $3\frac{1}{2}$ to 4
	Between LL and pelvic fin base $2\frac{1}{2}$
	Between LL and anal fin base $2\frac{1}{2}$
	Circumpeduncular 10 or 11

Gill Rakers : 4 + 10

Size : 57.0 mm TL

Colour : Dorsally olive-green, sides and belly silvery. Dorsal with a black spot on the base of third to eighth rays. A black spot on end of lateral line on 23 and 24th scales. At times a black spot on anal fins' second to fifth rays. Mature specimens show a crimson lateral band. Scale margins tinged brown.

Distribution : INDIA : Kalakkad, S.India. Sri Lanka.

Relationship : It is close to *P. dorsalis* from South India from which it differs chiefly in colouration and the articulated, non osseous dorsal ray. It is evidently derived from a *dorsalis* like ancestor. Gunther (1868) considered this species as related to *P. carnaticus* from which however it differs radically in scale counts, and colour pattern.

It is noteworthy that Day (1878, 1889) did not include this species nor made any mention of it anywhere.

Additional Data : N = 7

TL/Body depth	20.45 to 24.55
TL/Head length	20.91 to 24.77
SL/Pre dorsal	46.15 to 53.41
SL/Pre pelvic	50.00 to 52.27
SL/Pre anal	68.66 to 75.82
LH/LCPD	57.69 to 78.26
LH/HCPD	38.46 to 56.52
LH/Dorsal fin base	46.15 to 58.33
LH/Width of Mouth	15.38 to 26.08

***Puntius denisonii* (Day)**

Labeo denisonii Day, *Proc. zool. Soc. Lond.*, p.299, 1865 (type locality, Mundikyam, Travancore, Kerala).

Puntius denisonii Day, *Fish. Malabar*. p.212, pl.16, fig.2, 1865.- Jayaram, *Handbk. FW. Fish. India*, p.100 (distribution), p.108 (key), 1981.

Barbus denisonii, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.146, 1868.- Day, *Fish. India*, p.573, pl.143, fig.2, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.320, 1889.- Venkateswarlu & Rama Rao, *Occ. Paper zool. Surv. India*, No.87. p.13, 1986 (synonym of *P. jerdoni*).

Barbus (Puntius) denisonii, Hora & Law, *Rec. Indian Mus.*, 43(2), p.237, 241, 1941 (name only, distribution, Kerala only).

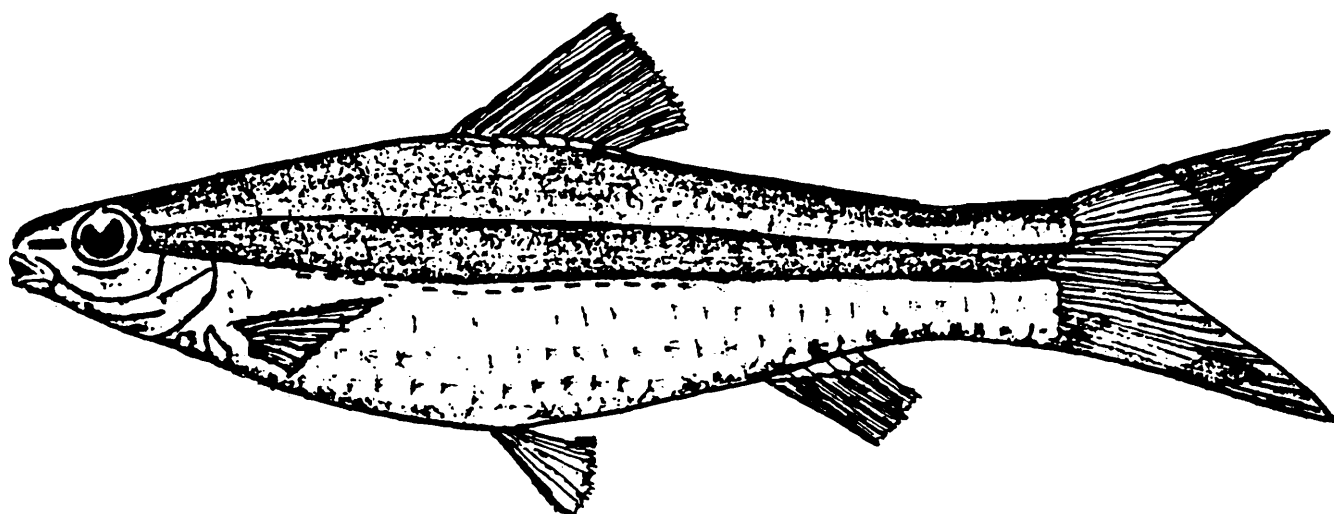
Vernacular Names : NIL

Specimens Studied : ZSI, F.2371, Holotype, 104 mm SL, Travancore hill ranges, F. Day.

Diagnosis : A moderately elongated fish without any vertical colour bands, but with a longitudinal black band above which another scarlet stripe is present. Two barbels, dorsal ray weak, articulated. Lateral line complete with 23 to 26 scales.

Description : D. II, 9; P. i, 16; V. i, 8; A. i, 5; C. 19; LL. 23 to 26.

Dorsal and ventral profiles gentle without much of a rise. Head moderately long. Head length 22.11, body depth 26.44 in percent of standard length. Head width 34.78, height of head at occiput 69.56, snout 34.78 in percent of head length. Snout plain, obtuse. Eyes large, in middle of head, 28.26 in percent of head length, 92.85 in percent of interorbital width, 81.25 of snout length. Mouth subterminal, its width less than inter-nostril distance. Lips thin, plain. One pair of barbels.



Lateral view of *P. denisonii*

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray weakly osseous, smooth. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 51.16 in percent of its length. Lateral line complete.

Scales : PDS 9; Pre anal 14; Pre pelvic 7

Between LL and dorsal fin base	$4\frac{1}{2}$
Between LL and pelvic fin base	$2\frac{1}{1}$
Between LL and anal fin base	$2\frac{1}{2}$
Circumpeduncular	11

Gill Rakers : 4 + 12

Size : 150 mm TL

Colour : In preserved examples pale brown with no colour bands visible. In life reported to be silvery, with a black band above which another scarlet stripe running from snout to mid caudal. Dorsally light blue over whole body. Caudal fin with an oblique black band crossing the posterior third of each lobe. Scales azure blue.

Distribution : INDIA. Muidikayam, Travancore hill ranges, Kerala. Not recorded subsequent to Day (1865).

Relationship : Related to *P. dorsalis* though distantly, differing from it in having longitudinal colour bands and the dorsal fin ray being weak, (vs. plain body and a strong smooth dorsal spine in *P. dorsalis*).

Additional Data :

SL/Pre dorsal	48.07
SL/Pre anal	78.36
SI/Pre pelvic	53.36
LH/LCPD	93.47
LH/HCPD	47.82
LH/Dorsal fin base	65.21
LH/Width of mouth	17.39

***Puntius melanostigma* (Day)**

Systomus carnaticus Jerdon, *Madras J. Lit. & Sci.*, 15, p.315, 1849 (type locality, Bhavani river at foot of Nilgiris and also Cauvery river).

Barbus melanostigma Day, *Fish. India*, p.573, pl.143, fig.1, 1878 (type locality, Wynaad, Kerala).- Day, *Fauna Brit. India. Fish.*, 1, p.320, 1889.- Jenkins, *Rec. Indian Mus.*, 3, p.289, 1909.- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 39(3) p.511 (Aounda river, Deolali), 519 (Dama river) 1937.- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 40(1) p.22, 1938 (Deolali).

Barbus (Puntius) melanostigma, Hora & Law, *Rec. Indian Mus.*, 43, p.241, 1941 (name only, distribution).

Puntius melanostigma Jayaram, *Handbk. FW. Fish India*, p.101 (description), p.108 (key), 1981.- Jayaram *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.60, 1982 (key, Cauvery river, S. India, First record subsequent to original description).

Vernacular Names : NIL

Specimens Studied : ZSI, SRS, Unreg. 6 exs., 64.00 to 88.00 mm SL, River Cauvery at Chunchunakatte K.R. Nagar dist., Karnataka, KCJ coll., 8.10.75.

Diagnosis : A moderately deep bodied fish without any vertical colour bands, two maxillary barbels, dorsal ray weak, inferiorly osseous, articulated in upper half, lateral line complete with 23 to 26 scales. A light band on side with a caudal blotch.

Description : D. II, 8; P. 15-16; V. i, 7-8; A. i-ii, 4-5; C. 15; LL. 23-26.

Dorsal and ventral profiles equally arched. Head short, blunt. Head length 27.17 to 28.73, body depth 30.67 to 35.97 in percent of standard length. Head width 47.85 to 57.14,

height of head at occiput 75.19 to 84.03, snout 26.11 to 34.25 in percent of head length. Snout obtuse, without any pores or tubercles. Eyes in middle of head, 21.74 to 31.54 in percent of head length, 55.56 to 92.59 in percent of interorbital width and 75.19 to 93.46 of snout length. Mouth subterminal, its width less than inter-nostril distance. Lips thick, plain. One pair of barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray very weak, osseous inferiorly and articulated in its upper half. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins do not extend to pelvics; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 62.11 to 84.75 in percent of its length. Lateral line complete.

Scales : PDS 8 or 9; Pre-anal 11-14; Pre-pelvic 5-7

Between LL and base of dorsal fin $4\frac{1}{2}$ to 5

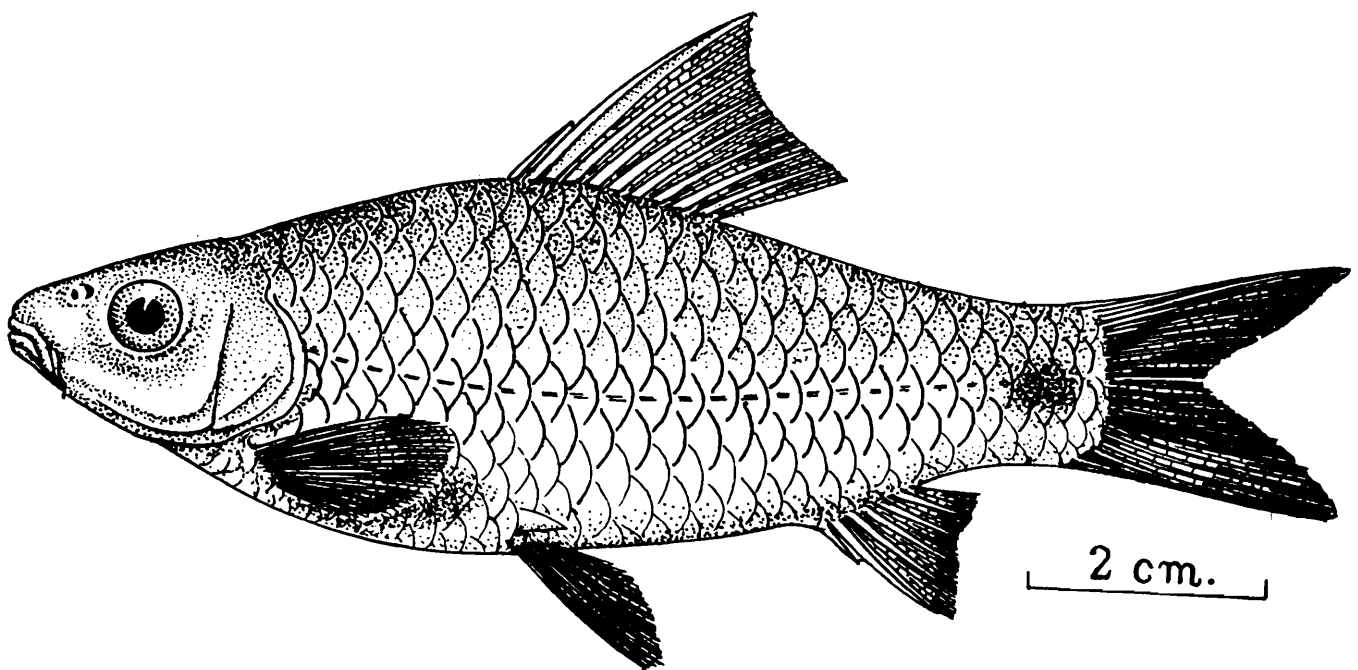
Between LL and base of pelvic fin $2\frac{1}{1}$ to $3\frac{1}{2}$

Between LL and base of anal fin $2\frac{1}{2}$ to $3\frac{1}{2}$

Circumpeduncular 9 or 10

Gill Rakers : 7 or 8 + 9 or 10

Size : 103 mm TL



Lateral view of *P. melanostigma*

Colour : Silvery above becoming white on sides and below, a light band along the side, a deep black blotch on the caudal base on 21-22 scale, dorsal and caudal fins stained with grey, sometimes a dark band along the side.

Distribution : INDIA : Wynaad, Kerala; Bhavani and Cauvery rivers; Maharashtra.

Relationship : Close to *P. denisonii* differing from it in having only one colour band; a less deep body and a narrower caudal peduncle.

Additional Data :

TL/Head length	20.45 to 23.26	N = 4
TL/Body depth	23.09 to 28.73	N = 4
SL/Pre dorsal	48.54 to 55.55	N = 6
SL/Pre anal	72.99 to 75.18	N = 6
SL/Pre pelvic	48.31 to 59.88	N = 6
LH/LCPD	56.49 to 76.33	N = 6
LH/HCPD	47.39 to 57.14	N = 6
LH/Dorsal fin base	62.89 to 88.49	N = 6
LH/Width of Mouth	17.39 to 25.00	N = 6

***Puntius arenatus* (Day)**

Barbus arenatus Day, *Fish. India*, p.574, pl.142, fig.7, 1878 (type locality, Madras).-Day, *Fauna Brit. India, Fish.*, 1, p.321, 1889.

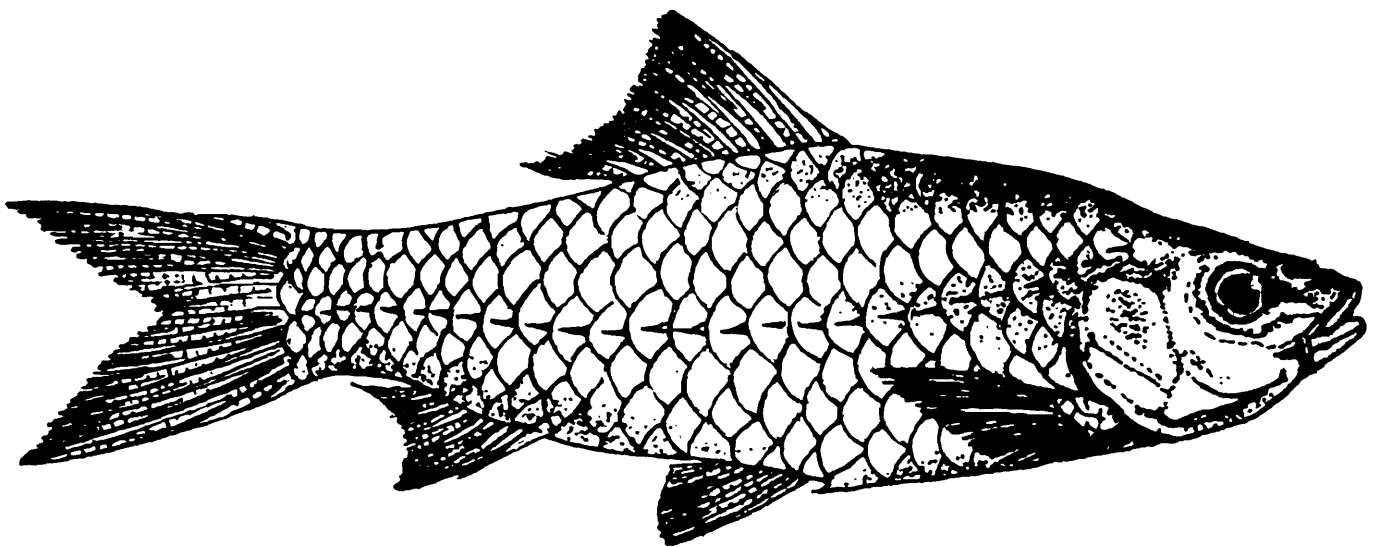
Puntius arenatus, Jayaram, *Handbk. FW. Fish. India*. p.99 (distribution), p.108 (key) 1981.

Vernacular Names : NIL

Specimens Studied : ZSI, F. 2737 Holotype, 130 mm SL. Madras, F. Day Coll. ZSI, SRS. F. 740, 5 exs., 62-89 mm SL, Vaigai Dam, K. Mathew Coll. 9.11.86.

Diagnosis : a moderately deep bodied fish without any colour bands on body, with a pair of barbels, dorsal spine weakly osseous, a complete lateral line, with 3¹/₂ scales between lateral line and pelvic fin.

Description : D. II, 8; P.15; V i, 8; A. iii, 5; C. 19; LL. 24-27.



Lateral view of *P arenatus*

Dorsal and ventral profiles equally arched gently. Head moderate, obtuse. Head length 26.67 to 30.86 body depth 27.25 to 33.33 in percent of standard length. Head width 48.78 to 59.52, height of head at occiput 70.42 to 83.33, snout 26.67 to 32.68 in percent of head length. Snout bluntly rounded, plain. Eyes moderate, 21.83 to 28.09 in per cent of head length, 54.64 to 75.19 in percent of interorbital width and 66.67 to 100.00 of snout length. Mouth subterminal, its width greater than inter-nostril distance. Lips plain. One pair of barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray weakly osseous smooth interiorly, becoming articulated superiorly, smooth. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins extending to pelvics; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 50.00 to 70.92 in percent of its length. Lateral line complete.

Scales : PDS 8-10; Pre-anal 10-13; Pre-pelvic 6-8

Between LL and dorsal fin base	4 $\frac{1}{2}$ - 5
Between LL and pelvic fin base	2 $\frac{1}{2}$ - 3 $\frac{1}{2}$
Between LL and anal fin base	2 $\frac{1}{2}$ to 3 $\frac{1}{2}$
Circumpeduncular	10 to 11

Gill Rakers : 5 + 16

Size : 124 mm TL

Colour : Silvery without any markings. Occasionally a dark band along the dorsal fin may be seen.

Distribution : INDIA: Tamil Nadu.

Relationship : Close to *P. melanostigma* differing from it in having a plain body and scale count.

Additional Data : N = 6

TL/Head length	20.49 to 22.83
TL/Body depth	20.96 to 24.60
SL/Pre dorsal	48.78 to 52.36
SL/Pre anal	67.11 to 78.74
SL/Pre pelvic	47.31 to 51.81
LH/Mouthwidth	20.00 to 29.07
LH/LCPD	68.97 to 75.76
LH/HCPD	37.74 to 53.19
LH/Dorsal fin base	58.14 to 70.42

The “*filamentosus*” group

This group comprises three complexes, the *filamentosus* complex, the *vittatus* complex and the *thomassi* complex. The first is widely distributed and has diversified into the other two. A comparison is presented in Table 6.

The “*filamentosus*” complex*Species* :

P. filamentosus (Valenciennes), 1842, p.96

P. waageni (Day), 1873, p.325

Common Characters :

1. Last unbranched dorsal ray not ossified, articulated.
2. Lateral line scales 20 - 24.
3. PDS 7 to 10.
4. LL/Dorsal 4 to $5\frac{1}{2}$.
5. LL/anal $2\frac{1}{2}$ to $3\frac{1}{2}$.
6. Circumpenduncular 9 or 10.
7. Pre-anal 11 to 14, pre-pelvic 6 to 9 scales.
8. A dark blotch on tail.

Puntius filamentosus (Valenciennes)

“DMK Fish” “Black Spot Barb”

- Leuciscus filamentosus* Valenciennes, *Hist. Nat. Poiss.*, 17, p.95, pl.492, 1844 (type locality, Alleppey, Kerala).- Bleeker, *Verh. Bat. Gen.*, 25, p.68, 1853.
- Systomus assimilis* Jerdon, *Madras J. Lit. & Sci.*, 15, p.319, 1849 (type locality, rivers in “Canara”).
- Systomus madraspatensis* Jerdon, *Madras J. Lit. & Sci.*, 15, p.318, 1849 (type locality, river in “Canote in Malabar”).
- Barbus filamentosus*, Day, *Fish. India*, p.582, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.333.- Gunther, *Cat. Fish. Brit. Mus.*, 7, p.145, 1868.- Raj, *Rec. Indian Mus.*, 12, 251, 1916 (Madras).- Hora, *Rec. Indian Mus.*, 39, p.15 (Sharavaty river, Jog falls), p.22, Text figs.8, 9 *mahecola* synonymised, discussion regarding sexual dimorphism), 1937.- Misra, *Rec. Indian Mus.*, 40, p.258, 1938 (Kodur, Nallamalai Hills, Eastern Ghats).- David, *Proc. nat. Inst. Sci. India*, 22B(3), p.153, 1956 (Bhadra river at Bhadravati).
- Leuciscus mahecola* Valenciennes, *Hist. Nat. Poiss.*, 17, p.305, pl.502, 1844 (type locality, Mahe, Barbels not shown).- Bleeker, *Verh. Bat. Gen.*, 25, p.68, 1853.- Jerdon, *Madras J. Lit. & Sci.*, p.322, 1849.
- Puntius (Capoeta) lepidus* Day, *Proc. zool. Soc. Lond.*, p.196, 1868.- Hora, *Rec. Indian Mus.*, 39, p.24, 1937 (Coorg; young of *P. filamentosus*).
- Barbus mahecola*, Day, *Fish. India*, p.575, pl.140, fig.5, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.323, text fig.105, 1889.- Raj, *Rec. Indian Mus.*, 12, p.251, 1916 (Madras).- Hora, *Rec. Indian Mus.*, 39, p.24 (Cauvery, Coorg; synonymised with *filamentosus*).- Hora & Law, *Rec. Indian Mus.*, 43(2), p.236, 1941 (name only).- Venkateswarlu & Rama Rao, *Occ. Paper zool. Surv. India*, No.87, p.13, 1986 (synonym of *P. filamentosus*).
- Barbus (Puntius) mahecola*, Hora, *Rec. Indian Mus.*, 44(2) 196, 1942 (name only, Coorg, Wynaad, Nilgiris).

Barbus (Puntius) filamentosus, Hora & Law, *Rec. Indian Mus.*, 43, p.245, 1941 (Manimala river, Peruntenuvi, Kallada river, Kulathupuzha, Central Kerala).- Hora & Nair, *Rec. Indian Mus.*, 43, p.387, 1941 (Kallar stream, Trivandrum, Kerala).- Hora, *Rec. Indian Mus.*, 44, p.195, 1942 (name only, distribution, Coorg, Nilgiris, Wynaad).- Silas, *J. Bombay nat. Hist. Soc.*, 49(4), p.675, 1951 (Nelliampathi Hills, Periyar drainage, Kerala).

Puntius filamentosus, Day, *Fish. Malabar*, p.215, 1865.- Deraniyagala, *Spolia Zeylanica*, 16(1), p.13, 1930 (description, distribution in Sri Lanka).- Herre, *Spolia Zeylanica*, 24(3), p.175, 1946 (Galatabendiyava Yakvala, Sri Lanka).- Silads, *Bull. Nat. Inst. Sci. India*, No.7, p.251, 1952 (name only, Sri Lanka).- Rajan, *J. Bombay nat. Hist. Soc.*, 53(1), p.45, 1955 (name only, Bhavani and Moyar rivers, Nilgiri Hills).- Muroe, *Marine & FW. Fish. Ceylon*, p.44, 1955 (synonymy, brief diagnosis, distribution in Sri Lanka).- Misra, *Rec. Indian Mus.*, 57(1-4), p.153, text. fig.78, 1962 (brief description).- Menon, *Rec. zool. Surv. India*, 59(3), p.379, 1966 (Veeranam Lake).- Menon, *Ichthyologica*, p.147, July-Dec. 1967 (*P. mahecola* synonymised).- Tilak, *Rec. zool. Surv. India*, 67(1-4), p.93, 1973 (Goa, Chapora river, Pemem, Valus river, Arvalem water falls).- Jayaram *et al.*, *Bull. Madras Govt. Fisheries dept.*, 7 p., 1976 (Cardamom hills, variations). -Jayaram, *Handbk. FW. Fish. India*, p.100 (distribution), p.108 (key), 1981.- Jayaram *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.58, fig.11, 1982 (key, Cauvery river, S. India, relationship with *P. mahecola* shown).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.37, 1984 (common and vernacular names).

Vernacular Names : *Macha kendai*; *Sevali*, Tam; *Kachi parval*, Mal.

Specimens Studied : ZSI, SRS (Unregd.), 131 exs, 51.0 to 101.0 mm SL, all males from River Cauvery, KCJ coll., 1973, 1974, 1977.

ZSI, SRS (Unregd.), 77 exs., 41.0 to 113.50 mm SL, all females, from River Cauvery, KCJ coll., 1973, 1974, 1977.

ZSI, SRS (Unregd.), 7 exs., 63.5 to 84.0mm SL, all males from River Krishna at Haripur, Sangli, Maharashtra, KCJ coll., 27.12.1987.

ZSI, SRS (Unregd.), 2 exs., 57.0 & 58.0 mm SL, both males, Kurnool Fish market purchased, Catch from River Tungabhadra, Andhra Pradesh, KCJ col., 14.12.1987.

ZSI, SRS (Unregd.), 2 exs., 57.0 & 65.0 mm SL, both males River Ghataprabha below Hidkal dam, Belgaum, Karnataka, KCJ coll., 5.5.1988.

ZSI, SRS (Unregd.), 2 exs., 62.0 & 64.0 mm SL both males, Karad Fish market, Satara district, Catch from River Krishna, Maharashtra State, KCJ coll., 30.12.1987.

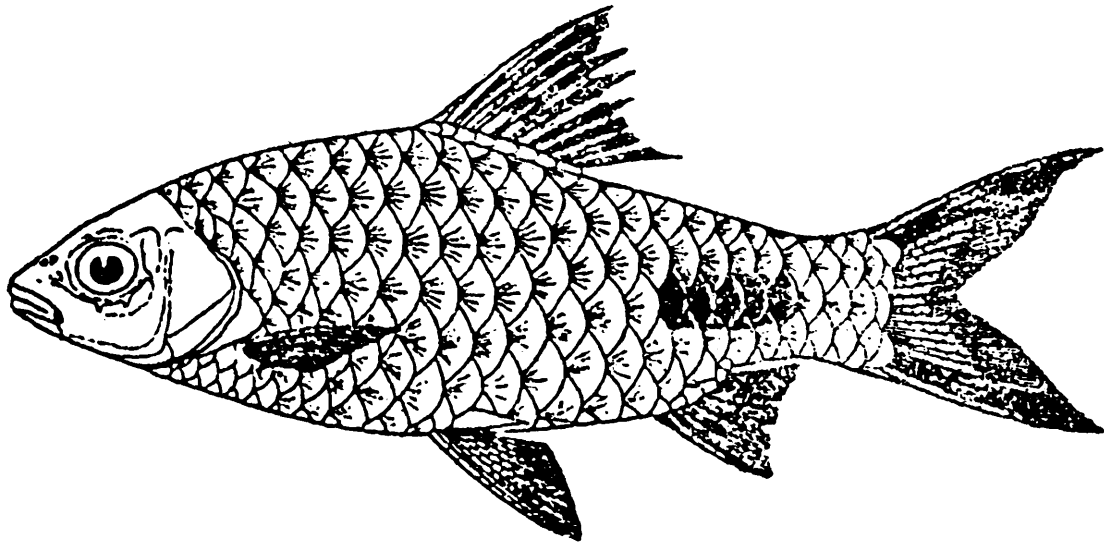
Diagnosis : A moderately deep bodied fish with a pair of rudimentary maxillary barbels, which may be even absent occasionally, dorsal ray not ossified, weak, articulated, smooth, lateral line complete and a black oval spot on caudal peduncle occasionally present.

Description : D. III-IV, 8; P. 15-16; V. i, 8; A. ii-iii, 5; C. 19-20; LL. 20-23.

Dorsal and ventral profiles arched. Head short, conical. Head length 21.45 to 28.90, body depth 25.51 to 40.16 in percent of standard length. Head width 42.37 to 57.80, height of head at occiput 58.82 to 83.33, snout 25.97 to 33.33 in percent of head length. Snout conical, the males often with large tubercles at breeding time. Eyes superior, 25.00 to 33.33 in percent of head length, 59.17 to 81.30 in percent of interorbital space width and 75.18 to 108.70 of snout length. Mouth subterminal, its width less than inter-nostril distance. Lips thin, plain, a rudimentary pair of maxillary barbels.

Dorsal fin inserted nearer tip of snout than base of caudal fin. Last unbranched dorsal ray articulated, feeble, smooth; the branched rays are prolonged in the adult male. Dorsal fin base less than least depth of caudal peduncle. Pectoral fins do not extend to pelvic fins; latter in turn do not reach anal opening. Anal fin when laid flat not reaching root of caudal

fin. Least depth of caudal peduncle 51.28 to 76.92 in percent of its length. Lateral line complete.



Lateral view of *P. filamentosus*

Scales : PDS 7-9; Pre pelvic 6 or 7; Pre anal 11-14

Between LL and dorsal fin base $4\frac{1}{2} - 5\frac{1}{2}$

Between LL and pelvic fin base $2\frac{1}{1} - 3\frac{1}{2}$

Between LL and anal fin base $2\frac{1}{2} - 3\frac{1}{2}$

Circumpeduncular 9 or 10

Gill Rakers : 4 or 5 + 15 or 15

Size : 180 mm TL

Colour : In life a dash of red alternating with black blotch on the caudal lobes is prominent. A finger like oval black blotch on 12-16 scale is also very characteristic of this species. Excepting *P. sarana sarana* no other species of *Puntius* has the oval caudal spot as longitudinal, mostly they are rounded. Young fishes have dark black vertical bands and pinkish fins. The colouration completely alters as the fish matures. The vertical bands vanish, and the fish takes on a bright silver sheen with a oval dot on the tail. They devour smaller fishes voraciously. Further, the males have the anterior four or five branched rays of the dorsal fin dark tipped and elongated.

Distribution : INDIA: Cauvery, Krishna drainages in Kerala, Andhra Pradesh, Karnataka, Tamil Nadu, Goa. Sri Lanka.

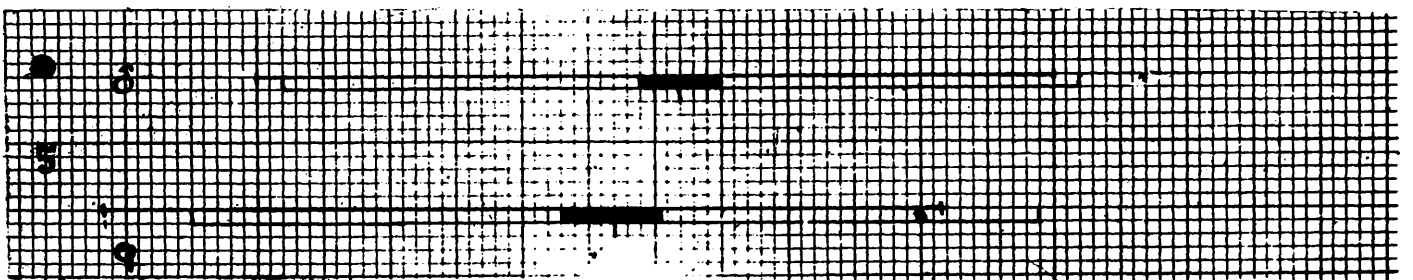
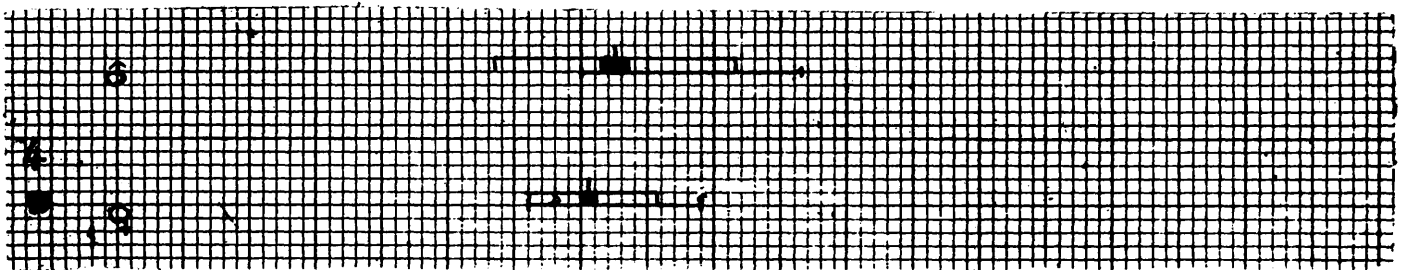
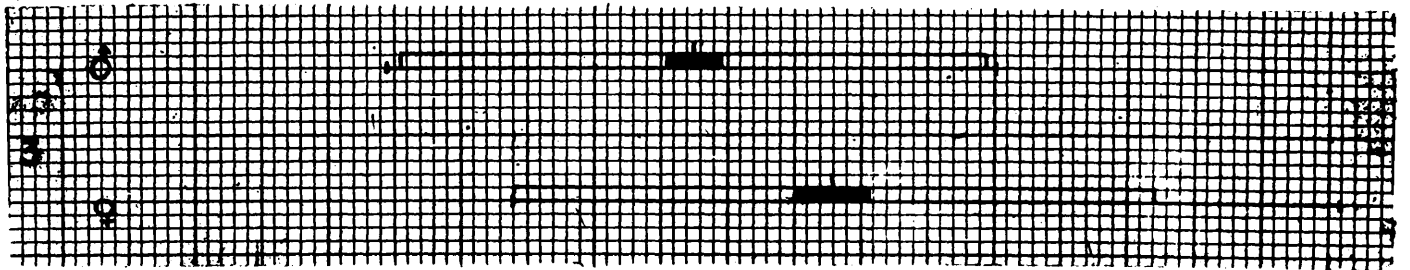
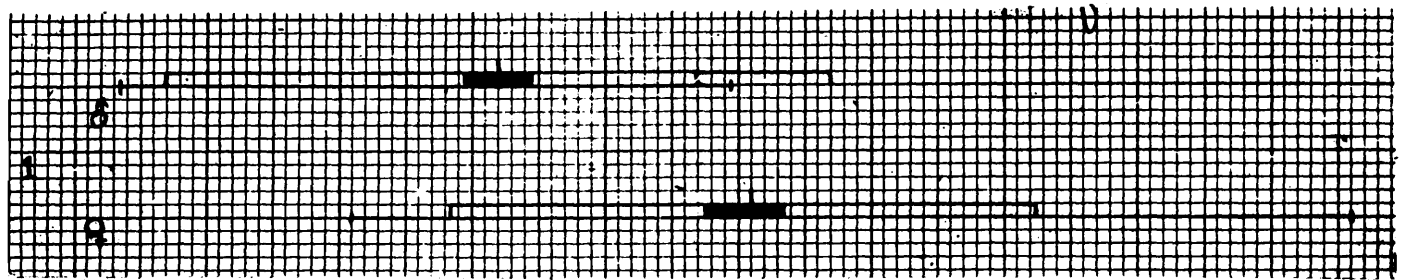
Relationship : Related to *sarana* group, differing from it in the number of barbels, lateral line scales and the dorsal spine being smooth.

TABLE - 6
Comparison of the species of the "*filamentosus*" group
The "*filamentosus*" complex

Characters	<i>P. filamentosus</i> (Val.), 1842, p. 96	<i>P. waageni</i> (Day) 1873, p.325	<i>P. vittatus</i> (Day) 1865, p.299
1. No. of barbels	Two, rudimentary, may be absent	NIL	NIL
2. Last unbranched dorsal ray	Not ossified, articulated or developed well in females	Not ossified, articulated	Not ossified, articulated
3. Lateral line	Complete	Incomplete after 7 or 8 scales	Incomplete after 5 or 6 scales
4. LL scales	20 - 23	23 - 24	20 - 22
5. PDS	7 to 9	8 to 10	8 to 10
6. LL/Dorsal	4 ¹ / ₂ - 5 ¹ / ₂	4	3
7. LL/Pelvic	2 ¹ / ₂ - 3 ¹ / ₂	4 ¹ / ₂	3
8. LL/Anal	2 ¹ / ₂ - 3 ¹ / ₂	3 ¹ / ₂	2 ¹ / ₂
9. Circumpeduncular	9 - 10	10	8 - 9
10. Pre-anal	11 - 14	11 - 13	10 - 12
11. Pre-pelvic	6 - 7	6 - 9	5 - 7
12. Gill Rakers	4 - 5 + 14 - 15	—	2 - 3 + 7
13. SL/LH	3.46 to 4.66	2.67 to 3.15	2.82 to 3.42
14. SL/Body depth	2.49 to 3.92	2.67 to 3.00	2.82 to 3.42
15. LH/Eye	3.08 to 4.00	2.67 to 4.33	3.00 to 4.00
16. LH/Snout	3.00 to 3.85	2.73 to 4.80	3.00 to 4.00
17. IOW/Eye	1.23 to 1.69	1.00 to 1.67	0.80 to 1.00
18. Snout/Eye	0.92 to 1.33	0.63 to 1.50	0.80 to 1.00
19. LCPD/HCPD	1.30 to 1.95	1.50 to 2.00	1.43 to 1.67
20. Width of Mouth	less than IND	equal to or less than IND	equal to or less than IND
21. Dorsal fin base	less than HCPD	greater than HCPD	equal to or less than HCPD
22. Colour	A black oval mark on 12-16 scales very faint in males, conspi- cuous in females	A dark blotch on 17 or 18th scale	A spot at caudal base A longitudinal streak
23. Distribution	South India, Sri Lanka	Western India Pakis'	Wide

TABLE - 6
Comparison of the species of the "*filamentosus*" group

The " <i>vitatus</i> " complex		The " <i>thomassi</i> " complex	
<i>P. muzzafarpurensis</i> Srivastava, 1976, p. 72	<i>P. coorgensis</i> Jayaram, 1981, p.47	<i>P. thomassi</i> (Day), 1873, p. 707	<i>P. lithopidos</i> (Day), 1873, p. 70
NIL	NIL	Four	Four
Not ossified, weak	Not ossified, articulated	Not ossified, articulated	Not ossified, articulated
Incomplete after 5 or 6 scales	Incomplete after 7 or 8 scales	Complete	Complete
22 - 23	22 - 25	31 - 34	38 - 40
8	6 - 7	11 13	12 - 14
4	3	5 - 6	6½ to 7
4½ - 5	2½	2½ - 3	3½ to 4
3	2½	3 - 3½	4 to 4½
10	9 12	10	14 to 15
11 12	15	18 or 19	22 to 24
6 - 7	7	10	10 to 12
8 + 15	4 + 6	3 + 12	7 + 16
2.92 to 3.50	2.56 to 3.52	3.67 to 3.95	3.33 to 3.82
2.48 to 2.60	2.73 to 3.56	3.42 to 3.88	4.23 to 4.40
3.10 to 3.70	2.85 to 4.00	3.06 to 3.50	3.77 to 4.67
3.50 to 4.00	2.67 to 4.18	2.67 to 2.80	2.23 to 2.37
1.14 to 1.33	0.74 to 1.50	0.94 to 1.18	1.27 to 1.44
1.00 to 1.17	0.80 to 1.50	1.12 to 1.29	1.59 to 2.00
1.40 to 1.60	1.14 to 2.15	1.25 to 1.79	1.56 to 1.75
equal to or less than IND	greater than IND	Less than IND	Less than IND
greater than HCPD	greater than HCPD	greater than HCPD	greater than HCPD
Bands on dorsal fin and body	No spots	Each scale with a dark base	No spots
Uttar Pradesh, Bihar	S. India	South Canara, Kerala	South Canara, Kerala



Bar diagrams depicting intergradation & divergences between *P. filamentosus* and *P. mahecola*

Remarks : Hora (1937), Hora & Law (1941) Menon (1967) Jayaram *et al.*, (1982) have demonstrated that *P. mahecola* Valenciennes, 1844 is only the female of this species and have correctly synonymised it. Menon (1967) compared a male specimen from Sri Lanka and four examples from Mahe, the type locality of *P. mahecola*. He concluded that in males generally five unbranched rays of the dorsal fin are elongated as filaments and they exhibit large tubercles on their cheeks. Small barbels are found hidden in the grooves round the corners of the mouth with juveniles tending to have longer barbels. The characteristic colour blotch which is oval in shape, covering three scale lengths, extends from 14 to 16th lateral line scales. However the extent of the oval blotch is variable; it may extend from 12th scale also. Selvaraj (1988) on the basis of morphometric studies differentiated *P. mahecola* from *P. filamentosus* by the length of the maxillary barbels, shape and size of the scales, (cleft of mouth, shape of dorsal fin, body depth, besides colouration). He advocated that *P. mahecola* should be restored to its original status of an independent species as proposed by Day (1878). Day (1878, p.556) stated that "In South Canara, the Wynaad, and the base of Neilgheries where the barbels are large (in size), the *Mahecola* abounds: towards Cochin and up the coramandel coast as far as Madras they are small or absent and the *B. filamentosus* is the type" Hora (1937), Hora & Law (1941) also studied this problem in detail and very clearly elucidated the identity of *B. filamentosus* Vs *B. mahecola*.

TABLE 7

Biometric Comparison of Males and Females of *Puntius filamentosus*

	N	Range	Mean	SD	SE	t
TL/BD	M 18	3.27 - 4.19	3.84	0.25	0.05	4.37
	F 14	3.61 - 5.12	4.21	0.22	0.06	
TL/LH	M 18	4.70 - 5.37	5.08	0.13	0.03	2.30
	F 14	4.87 - 5.64	5.19	0.14	0.04	
SL/BD	M 20	2.49 - 3.40	2.95	0.22	0.04	2.94
	F 22	2.68 - 3.92	3.16	0.24	0.05	
Snout/Eye	M 20	1.00 - 1.33	1.05	0.09	0.02	1.80
	F 22	0.92 - 1.18	1.01	0.05	0.01	
LH/Width of mouth	M 20	4.17 - 5.43	4.66	0.32	0.07	1.05
	F 22	4.00 - 5.20	4.56	0.30	0.06	

I have compared 20 male examples ranging from size 51.00 to 101.00 mm SL (67.00 to 132.50 mm TL) and 22 female examples of size 41.00 to 113.5 mm SL (60.00 to 148.00 mm TL) from the Cauvery river and Krishna systems collected By me. The data obtained are presentend in table 7. It may be seen that with the exception of body depth and diameter, all the features integrate with each other. Even in respect of the two apparently divergent

characters the divergence is not significant (see graph). My examination of a large series of this fish from different localities of Cauvery and Krishna river systems tend to support the view of earlier ichthyologists. Selvaraj studied only a sample of a lentic population and I am afraid unless more detailed comparison of samples from its entire range and until and unless it is proved the two has separate life histories it is better to consider *machecola* as a synonym of *filamentosus*.

Additional Data : N = 42.

TL/Head length	17.73 to 21.28
TL/Body depth	19.53 to 30.58
SL/Predorsal	44.05 to 52.08
SL/Pre anal	65.36 to 84.74
SL/Pre pelvic	41.49 to 53.19
LH/LCPD	71.43 to 94.34
LH/HCPD	44.84 to 86.90
LH/Dorsal fin base	48.07 to 89.28
LH/Width of mouth	18.42 to 23.98

Puntius waageni (Day)

Barbus waageni Day, *J. Asiat. Soc. Beng.*, 41(2), p.325, 1872 (type locality, Choya Saidan, Salt Range, Punjab).- Day, *Fish. India*, p.581, pl.144, fig.4, 1878.- Day, *Fauna Brit. India*, p.581, pl.144, fig.4, 1878.- Day, *Fauna Brit. India*, 1, p.332, 1889.- Hora, *Rec. Indian Mus.*, 25, p.377, 1923 (Salt Range, Pakistan; name only).

Puntius waageni, Menon, *Spl. Publ. No.1, Int. Fish. Soc. India*, p.43, 1974 (checklist of Himalayan & Indo-Genetic fishes).- Mirza, *Bijdr. Dierk.*, 45(2), p.172, 1975 (adjoining hills of Indus plain).- Mirza, *Biologia*, 22(1), p.115, 1976 (name only, montane and submontane regions of Pakistan).- Mirza, *Proc. Ist. Pakistan Cong. Zool.*, p.17, 1980 (checklist, distribution in Pakistan & Azad Kashmir).- Jayaram, *Handbk. FW. Fish. India*, p.103 (distribution), p.110 (key), 1981.

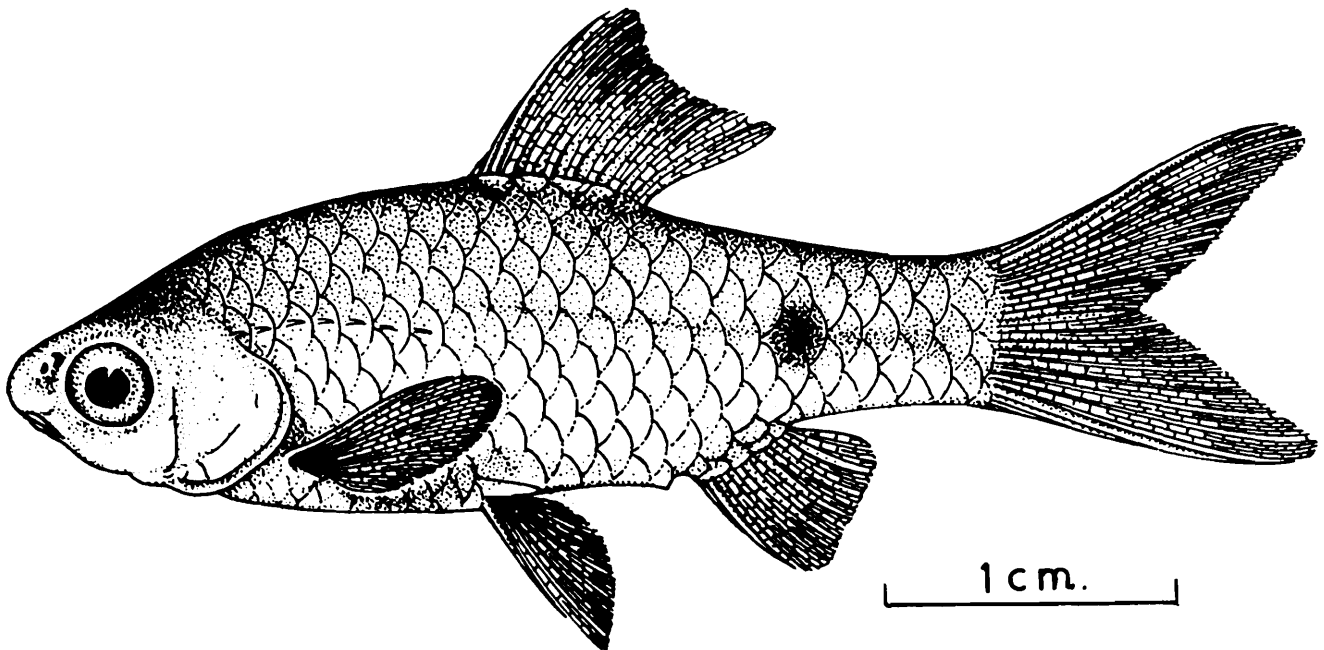
Vernacular Names : NIL

Specimens Studied : 10 ex F.302, ZSI, HAFZS, 24-38 mm SL, Livud village, Udhampur, Himachal Pradesh, Raj Tilak Coll. 3.2.1977.

Diagnosis : A medium sized fish with no barbels, the last unbranched dorsal ray not ossified, weak and articulated, with large eyes, incomplete lateral line ceasing after 7 or 8 scales with a spot on the 17th or 18th scale.

Description : D. II,8-9; P. 13-14; V.I,8; A. ii,6-7; C. 19; LL. 23-24.

Dorsal profile gently arched. Head moderate, bluntly rounded. Head length 31.71 to 37.50; body depth 33.33 to 37.48 in percent of standard length. Head width 33.33 to 57.14; height of head at occiput 73.33 to 105.55; snout 20.83 to 36.61 in percent of head length. Snout obtuse, plain without any pores. Eyes large in middle of head 23.07 to 37.50 in percent of head length, 60.00 to 100.00 in percent of interorbital width, 66.67 to 160.00 of snout length. Mouth subterminal, its width equal to or less than inter-nostril distance. Lips thin, plain. No barbels.



Lateral view of *P. waageni*

Dorsal fin inserted nearer caudal base than tip of snout. Last unbranched dorsal ray weak, articulated. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins extend to pelvic fins; latter reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 50.00 to 66.67 N = 11 in percent of its length. Lateral line incomplete, ceasing after 7 or 8 scales.

<i>Scales</i>	PDS 8-10; Pre-anal 11-13; Pre-pelvic 6-9
	Between LL and dorsal fin base 4
	Between LL and pelvic fin base 4 ¹ / ₂
	Between LL and anal fin base 3 ¹ / ₂
	Circumpeduncular 10

Gill Rakers : Not taken.

Size : Maximum 48 mm TL

Colour : Silvery, dark superiorly, a dark blotch on the side of the tail on about 17 or 18th row of scale.

Distribution INDIA: Shimla. PAKISTAN: Choya. Salt Range; Hills of Indus plain sand montane and submontane regions.

Relationships : Distantly related to *P. vittatus*.

Remarks : Syntypes 2 exs. ZSI 2300, 2408 Salt Range, Punjab, purchased from F. Day. Missing.

Additional Data :

TL/Head length	23.91 to 25.00	N = 3
TL/Body depth	27.08 to 27.17	N = 3
SL/Pre dorsal	50.00 to 66.67	N = 12
SL/Pre anal	63.83 to 83.33	N = 12
SL/Pre pelvic	46.80 to 62.50	N = 12
LH/Mouth width	16.67 to 28.57	N = 12
LH/LCPD	60.00 to 88.88	N = 11
LH/HCPD	33.33 to 52.63	N = 12
LH/Dorsalfin base	46.67 to 86.36	N = 5

The "*vittatus*" complex*Species :*

P. vittatus Day, 1865, p. 299.

P. muzzaffarpurensis, Srivatsava *et. al.* 1976, p.72.

P. coorgensis Jayaram, 1981, p.47

Common characters :

1. No barbels
2. Dorsalspine not ossified, weak, articulated.
3. Lateral line incomplete.
4. LL scales 20 to 25.
5. LL/Dorsal 3 or 4.
6. LL/anal 2 1/2 or 3.
7. Pre-pelvic scales 5 to 7.

Puntius vittatus Day

Puntius vittatus Day, *Proc. zool. Soc. Lond.*, p.303, 1865 (type locality, Mysore).- Day, *Fish. Malabar*, p.215, p.113, fig.1, 1865.- Deraniyagala, *Spolia Zeylanica*, 16(1), p.19, 1930 (description, distribution in Sri Lanka).- Herre, *Spolia Zeylanica*, 24(3), p.175, 1946 (Colombo, Galatabendiyaya, Sri Lanka).- Silas, *Bull. Nat. Inst. Sci. India*, No.7, p.251, 1952 (name only, Sri Lanka).- Munroe, *Marine & FW. Fish. Ceylon*, p.45, 1955 (synonymy, brief diagnosis, distribution in Sri Lanka).- Menon, MAS, *Rec. Indian Mus.*, 59(1 & 2), p.44, 1963 (Chilka Lake).- Datta & Majumdar, *Rec. zool. Surv. India*, 62(1 & 2), p.90, 1970 (Udaipur, Bharatpur, Jodhpur districts).- Mirza, *Biologia*, 20(1), p.79 1974 (name only, Indus plain & adjoining hills).- Mirza, *Bidjr. Dierk.*, 45(2), p.172, 1975 (Indus plain).- Rao, *Matsya*, 2, p.57, 1976 (Godavari estuary).- Jayaram, *Handbk. FW. Fish. India*, p.103 (distribution). p.110 (key), 1981.- Jayaram, *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.65, 1982 (key, Cauvery river, S. India).- Mirza & Abdussamad, *Biologia*, 28(1), p.69, 1982 (description, Pakistan).

Puntius sophore (not of Hamilton), Kner, *Novara Fische*, p.347, 1865-67.

Barbus vittatus, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.156, 1868.- Day, *Fish. India*, p.582, pl.144, fig.2, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.333, 1889.- Raj, *Rec. Indian Mus.*, 12, p.251, 1916 (Madras).- Hora, *Mem. Indian*

Mus., 5, p.765, 1923 (Chilka Lake, outer channel).- Hora, *Rec. Indian Mus.* 39, p.16, 1937 (Sagar, Shimoga dist., Kamataka).

Barbus (Puntius) vittatus. Hora & Law, *Rec. Indian Mus.*, 43(2), p.237, 1941 (name only, distribution).- Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (name only, distribution):

Vernacular Names : Kooli, Hind.

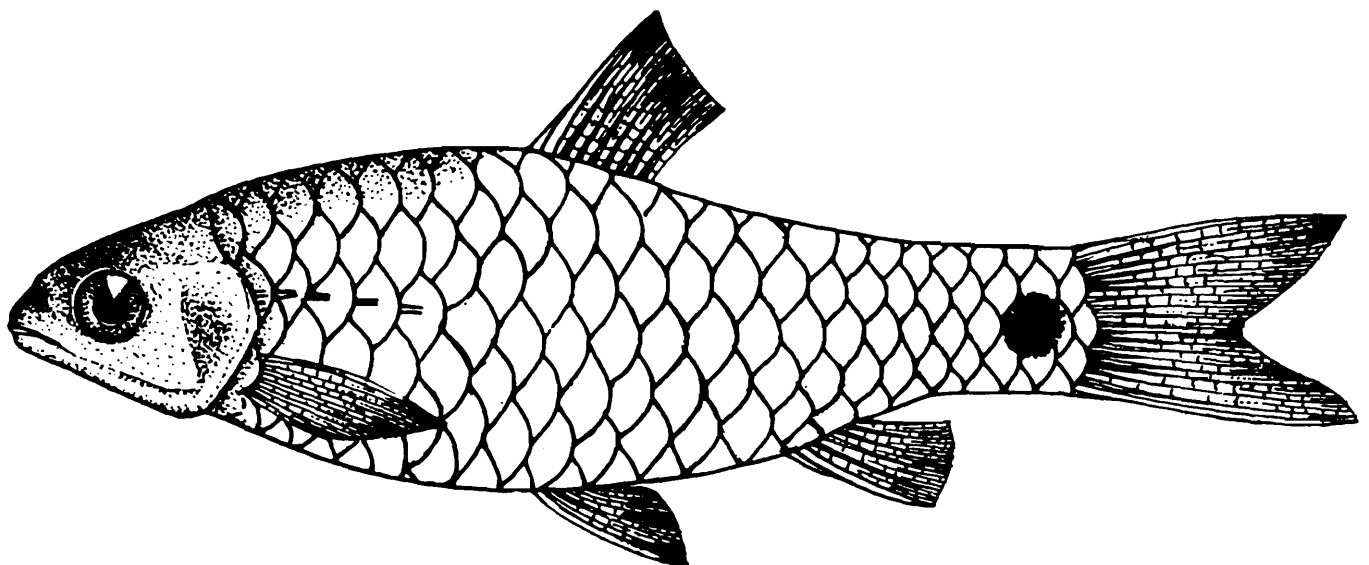
Specimens Studied : ZSI, F.5442/2, 4 Exs., 20.5 to 23.0 mm SL, Lake Chilka, Orissa, K.S. Misra Coll., 3.2.54.

Diagnosis : An elongated fish with body compressed behind dorsal fin. No barbels. Dorsal ray weak and articulated. Lateral line incomplete with 20 to 22 scales. A black streak across dorsal fin and a small dot on caudal base. Adults with four black spots on body.

Description : D. II, 8; P. 12-13; V i, 8; A. ii, 5; C. 19; LL.20-22.

Dorsal profile well arched, ventral profile slightly. Head moderately small and bluntly pointed. Head length 29.20 to 35.50, body depth 29.20 to 35.50 in percent of standard length. Head width 37.50 to 66.60, height of head at occiput 75.00 to 100.00, snout 25.00 to 33.00 in percent of head length. Snout plain, slightly pointed. Eyes moderately large, 25.00 to 33.30 in percent of head length, 100.00 to 125.00 in percent of interorbital width and 100.00 to 125.00 of snout length. Mouth anterosuperior, slightly arched, its width equal to or less than interostril distance. Upper lip reflected forward slightly. No barbels.

Dorsal fin inserted nearer tip of snout than to caudal base. Last unbranched dorsal ray weak, articulated and smooth. Dorsal fin base equal to or less than height of caudal peduncle. Pectoral fins do not extend to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching caudal base. Least height of caudal peduncle 60.00 to 70.00 in percent of its length. Lateral line incomplete, ceasing after 5 or 6 scales.



Lateral view of *P. vittatus*

Scales : PDS 8 to 10; Pre-anal 10 to 12; Pre pelvic 5 to 7

Between LL and dorsal fin base	3
Between LL and pelvic fin base	3
Between LL and anal fin base	2 $\frac{1}{2}$
Circumpeduncular	8 or 9

Gill Rakers : 2 or 3 + 7

Size : 35 mm TL

Colour : Light brown above lateral line, yellowish beneath. A black streak extends near gill cover to caudal base; a black spot at the base of dorsal fin and another at base of caudal fin; fins yellowish.

Distribution : INDIA: Tamil Nadu, Kerala, Karnataka, upto Goa and Kutch, Orissa, Rajasthan. Pakistan; Sri Lanka.

Relationship : Related to *P. waageni* differing in colouration and body proportions.

Remarks : Reported to feed on zooplankton.

Additional Data :

SL/Pre dorsal	47.80 to 53.30	N = 4
SL/Pre anal	62.20 to 75.50	N = 4
SL/Pre pelvic	48.80 to 56.00	N = 4
LH/LCPD	62.50 to 85.70	N = 4
LH/LCPD	60.00 to 70.00	N = 4
LH/Dorsal fin base	50.00 to 57.10	N = 4
LH/Width of Mouth	18.70 to 28.50	N = 4

***Puntius muzaffarpurensis* Srivastava, Verma & Sharma**

Puntius muzaffarpurensis Srivastava, Verma & Sharma, *Matsya*, 2, p.72, 1976, fig.1 (type locality, R. Bhagmati at Saidpur, Muzaffarpur, Bihar).- Srivastava, *Fishes of UP & Bihar*, p.65, fig.45, 1980 (key, description).- Jayaram, *Handbk. FW. Fish. India*, p.101 (distribution), 1981.

Vernacular Names : *Sidhari, pothi*, Hindi.

Specimens Studied : ZSI FF 1101 Holotype, 33.5 mm SL. Coll. Srivastava.

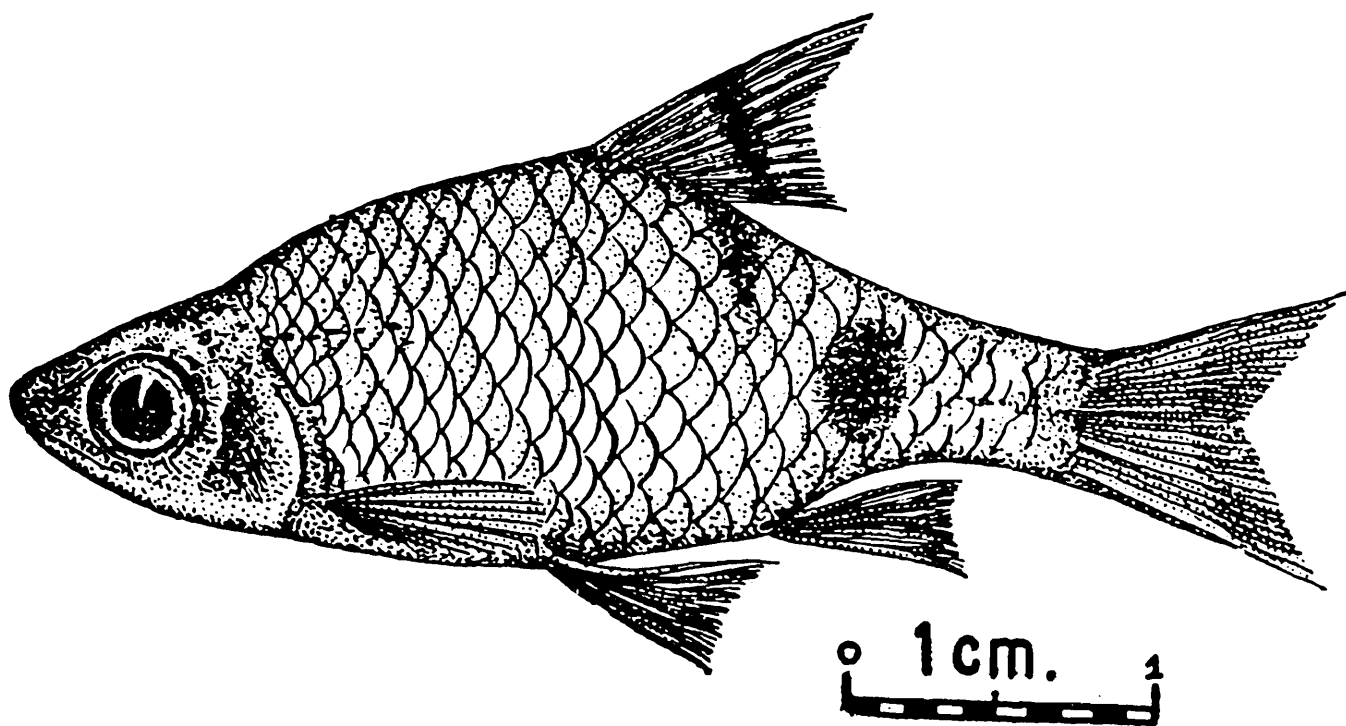
ZSI FF 1102 Paratype, 1 ex., 35 mm SL same data.

Diagnosis : A deep bodied fish without barbels, dorsal spine not ossified, weak and entire and an incomplete lateral line ceasing after 5 or 6 scales. A conspicuous hump from occiput to below dorsal fin base present.

Description : D. II, 8; P. 15-16; V. i, 8; A. ii, 5; C. 20; LL. 22-23.

Dorsal profile slightly more convex than ventral. Head small. Head length 28.57 to 34.28; body depth 38.46 to 40.29; in percent of standard length. Head width 41.67 to 62.50;

height of head at occiput 66.67 to 90.90, snout 25.00 to 28.57 in percent of head length. Snout obtuse, plain. Eyes large, 27.02 to 32.26 in head length, 75.00 to 87.50 in percent of interorbital width, 85.71 to 100.00 of snout length. Mouth small, its width equal to or less than inter-nostril distance. Lips plain. Barbels absent.



Lateral view of *P. muzaffarpurensis*

Dorsal fin inserted slightly anterior to pelvic fins, nearer tip of snout than caudal base. Last unbranched dorsal ray is weak and entire. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins extend to pelvic fins; latter reach anal opening. Anal fin when laid flat does not reach the root of caudal fin. Least depth of caudal peduncle 62.50 to 71.43 in its length. Lateral line incomplete ceasing after 5 or 6 scales.

Scales :	PDS 8; Pre-anal 11 or 12; Pre-pelvic 6 or 7
	Between LL and dorsal fin base 4
	Between LL and pelvic fin base 4 1/2 to 5
	Between LL and anal fin base 3
	Circumpeduncular 10

Gill Rakers : 8 + 15

Size : 46 mm TL

Colour : Body silvery with dorsal side dark grey. Outer margins of dorsal, anal and caudal fins dark grey. A dark grey vertical band in middle of dorsal fin and a conspicuous dark spot above posterior base of anal fin present. A vertical curved band extends from the posterior base of dorsal fin to middle of the lateral side.

Distribution : INDIA: River Bhagmati, Saidpur, Tirhut division, Bihar.

Relationships : Closely related to *P. vittatus* differing from it in the body shape being more arched with a distinct hump, possession of four colour black spots on body (vs two) and distribution.

Additional Data :

TL/Head length	25.00 to 30.43	N = 2
TL/Body depth	26.08 to 32.14	N = 2
SL/Pre dorsal	54.28 to 56.72	N = 2
SL/Pre anal	68.66 to 75.71	N = 2
SL/Pre pelvic	45.71 to 50.75	N = 2
LH/Mouth width	19.05 to 25.00	N = 2
LH/LCPD	66.67	N = 1
LH/HCPD	41.67 to 47.62	N = 2
LH/Dorsal fin base	58.33 to 66.67	N = 2

Puntius coorgensis Jayaram

Puntius coorgensis Jayaram, *Matsya*, 7, p.47, fig., 1981 (type locality, R. Cauvery at Bhagamandala, Coorg dist.)
- Jayaram, *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.56, 1982 (key, Cauvery river, S. India).

Vernacular Names : NIL

Specimens Studied : FF. 1715 ZSI, Holotype, 26.5 mm SL, R. Cauvery at Bhagamandala, Coorg dist., Karnataka, 4.5.1977, KCJ. coll.

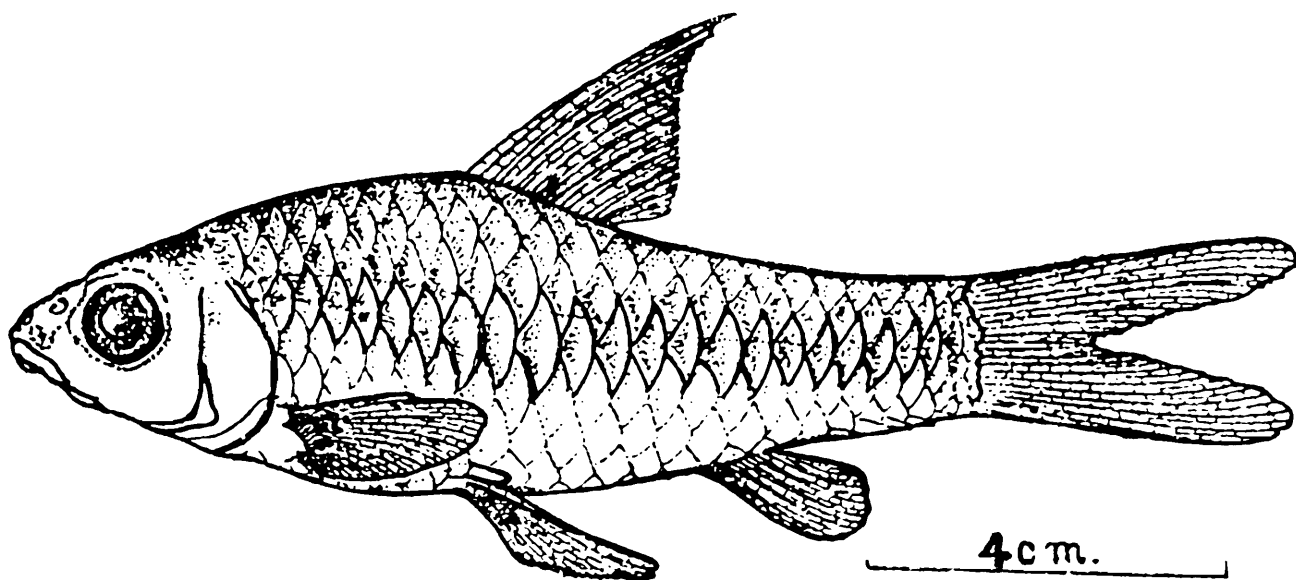
FF 1716 ZSI 22 exs., Paratypes, 20.5 to 27.0 mm SL, same data.

Diagnosis : A deep bodied fish without barbels and incomplete lateral line, ceasing 7th or 8th scale with dorsal ray weak and articulated, with 22 to 25 scales on lateral line and 6 or 7 pre-dorsal scales.

Description : D. I-II, 7-8; P. 14-15; V. i, 8; A. i-ii, 5; C. 19-20; LL. 22-25.

Dorsal profile arched, ventral profile nearly equally arched. Head small blunt. Head length 28.39 to 39.02; body depth 28.10 to 36.59 in percent of standard length. Head width 41.80 to 51.49; height of head at occiput 65.00 to 74.63; snout 23.88 to 37.50 in percent of head length. Snout obtusely rounded without any tubercles or pores. Eyes large, in middle of head, 25.00 to 35.06 in percent of head length, 66.67 to 135.00 in percent of interorbital width, and 66.67 to 125.00 of snout length. Mouth anterior, its width greater than inter-nostril distance. Lips thick, plain. No barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray articulated and weak. Dorsal fin base greater than least height of caudal peduncle. Pectoral fins extend to pelvic fins; latter reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 46.55 to 88.00 in percent of its length. Lateral line incomplete ceasing at 7th or 8th scale from anterior.



Lateral view of *P. coorgensis*

Scales : PDS 6 or 7; Pre-pelvic 7; Pre-anal 15

Between LL and dorsal fin base	3
Between LL and pelvic fin base	2½
Between LL and anal fin base	2½
Circumpeduncular	9-12

Gill Rakers : 4 + 6

Size : Maximum 36.6 mm TL

Colour : Uniformly light brown with a dark tinge at caudal base, fins colourless.

Distribution : INDIA: River Cauvery, Coorg district and upper reaches.

Relationships : Closely related to *P. vittatus* differing from it as follows :

Additional Data :

TL/Head length	22.22 (21.14 to 24.24)	N = 22
TL/Body depth	21.99 (20.92 to 24.28)	N = 22
SL/Pre dorsal	52.23 (44.44 to 68.29)	N = 22
SL/Pre anal	67.32 (60.87 to 73.47)	N = 5
SL/Pre pelvic	46.78 (44.00 to 49.05)	N = 5
LH/Mouth width	22.73 (19.48 to 28.57)	N = 5
LH/LCPD	79.74 (62.50 to 87.50)	N = 23

LH/HCPD	44.27 (40.30 to 50.00)	N = 23
LH/Dorsal fin base	57.84 (50.00 to 64.93)	N = 23

TABLE 8

Comparison of *P. vittatus* and *P. coorgensis*

Characters	<i>P. vittatus</i>	<i>P. coorgensis</i>
Lateral line	ceasing after 5 or 6th scale	ceasing after 7th or 8th scale
LL/pelvic	3	2½
LL scales	20-22	22-25
Pre-dorsal scales	8 to 10	6 to 7
Colour	Silvery, with four black spots in the adult. Dorsal fin with a vertical black stretch and a black tip with orange markings.	Uniform light brown, with a dark tinge at caudal base. Fins colourless.

The "*thomassi*" complex*Species* :

P. thomassi (Day), 1873, p. 707.

P. lithopidos (Day), 1873, p.708.

Common characters :

1. Four barbels.
2. Dorsal spine not ossified, articulated.
3. Lateral line complete.
4. LL scales 31 - 40
5. Confined to S.Kanara, Kerala.

Puntius thomassi (Day)

Barbus (*Barbodes*) *thomassi* Day, *Proc. zool. Soc. Lond.*, p.707, 1873 (type locality, S. Canara).

Barbus thomassi Day, *Fish. India*, p.567, pl.137, fig.5, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.311, 1889.- Hora, *Rec. Indian Mus.*, 39, p.20, 1937 (name only).

Puntius thomassi, Misra, *Rec. Indian Mus.*, 57(1-4), p.154, 1962 (brief description).- Jayaram *et al. Bull. Madras, Govt. Fisheries dept.* 7, p5, 1976. -Jayaram, *Handbk. FW. Fish. India*, p.103 (distribution).p.106 (key), 1981.- Jayaram, *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.64, 1982(key, Cauvery river, S. India).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.38, 1984 (common & vernacular names).

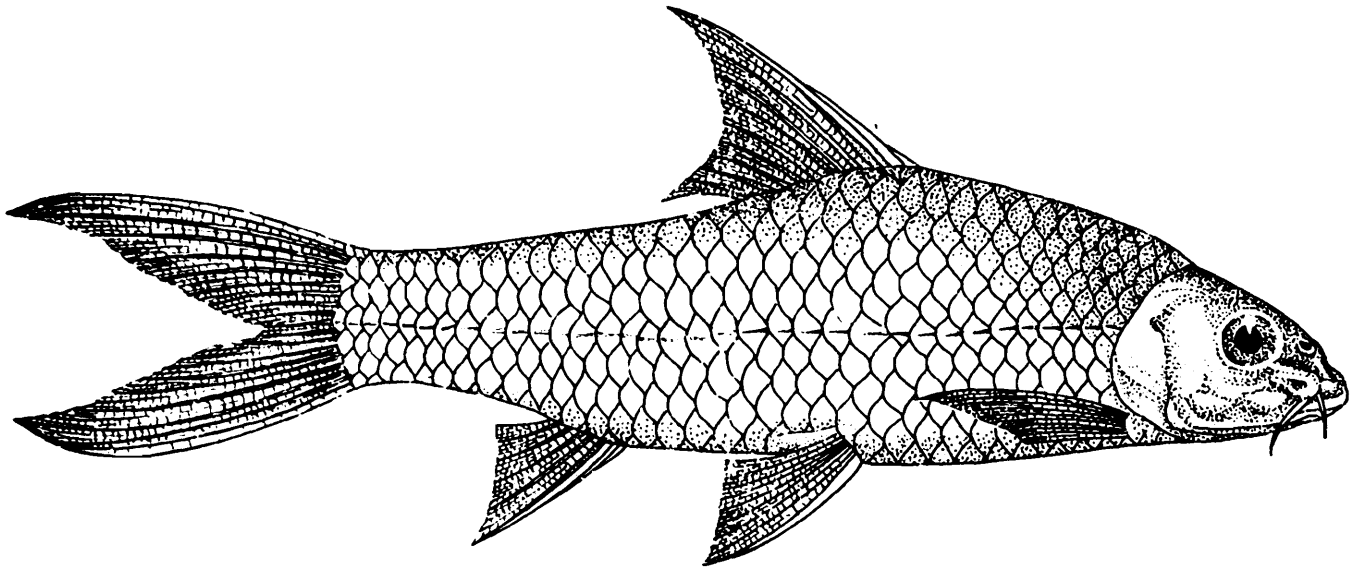
Vernacular Names : *Kempu paruwal*, Kan.

Specimens Studied : ZSI, SRS, 3 Exs., Unreg. 77-97 mm SL Andoorpacha, Kerala, Koshy Mathew Coll., 22.1.73.

Diagnosis : A moderately elongated fish without any bands and with four barbels,

dorsal ray weak, articulated, lateral line complete with 31 to 34 scales. Each scale with a red lunule and dark base.

Description : D. II-III, 8-9; P. 17; V i,8; A. ii-iii. 5; C. 19; LL. 31-34.



Lateral view of *P. thomassi*

Dorsal profile about equally convex with ventral profile. Head conical, Head length 25.32 to 27.25, body depth 25.77 to 29.25 in percent of standard length. Head width 53.19 to 54.65, height of head at occiput 71.43 to 79.36, snout 35.71 to 37.45 in percent of head length. Snout conical, plain. Eyes 28.57 to 32.68 in percent of head length, 85.47 to 106.38 in percent of interorbital width, 77.52 to 89.28 of snout length. Mouth subterminal, its width less than inter-nostil distance. Lips plain. Two pairs of barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray weak, articulated. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 55.86 to 80.00 in percent of its lengths. Lateral line complete.

Scales : PDS 11 to 13; Pre-anal 18 or 19; Pre-pelvic 10.

Between LL and dorsal fin base	5 or 6
Between LL and pelvic fin base	2½ to 3
Between LL and anal fin base	3 to 3½
Circumpeduncular	10

Gill Rakers : 3 + 12

Size : 110 mm TL.

Colour : Silvery along back, each scale with a red lunule; dorsal and caudal fins lake

colour, last edged with black. Pelvic and anal also of lake colour, stained with greyish-black. Most scales have a dark base.

Distribution : INDIA : South Kanara, Kerala.

Relationships : Related to *P.lithopidos* differing from it in not having a horny covering on jaw, less number of lateral line scales and colouration.

Additional Data :

TL/Head length	21.23	N = 1
TL/Body depth	22.12	N = 1
SL/Pre dorsal	47.85 to 56.49	N = 3
SL/Pre anal	69.93 to 78.74	N = 3
SL/Pre pelvic	48.54 to 57.47	N = 3
LH/LCPD	81.31 to 81.97	N = 2
LH/HCPD	45.25 to 51.02	N = 3
LH/Dorsal fin base	52.36 to 67.56	N = 3
LH/Width of Mouth	19.65 to 22.94	N = 3

***Puntius lithopidos* (Day)**

Barbus (Barbodes) lithopidos Day, *Proc. zool. Soc. Lond.*, p.708, 1873 (type locality, South Canara).

Barbus lithopidos, Day, *Fish. India*, p.567, pl.138, fig.2, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.310, 1889.- Jenkins, *Rec. Indian Mus.*, 3, p.289, 1909.- Hora, *Rec. Indian Mus.*, 39, p.19 1937 (Cauvery river, Coorg).- David, *Proc. nat. Inst. Sci. India*, 22B(3), p.153, 1956 (Bhadra river at Bhadravati).

Barbus (puntius) lithopidos, Hora & Law, *Rec. Indian Mus.*, 43(2), p.237, 1941 (name only, distribution, Kerala).- Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (name only, Coorg, Wynaad, Nilgiris).

Puntius lithopidos, Jayaram, *Handbk. FW. Fish. India*, p.101 (distribution), p.105 (key), 1981.- Jayaram *et al.*, *Occ. paper zool. Surv. India*, No.36, p.60, 1982 (key Cauvery river, S. India).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No. 56, p.37, 1984 (common and vernacular names).

Vernacular Names : *Kari meen*, Kan.

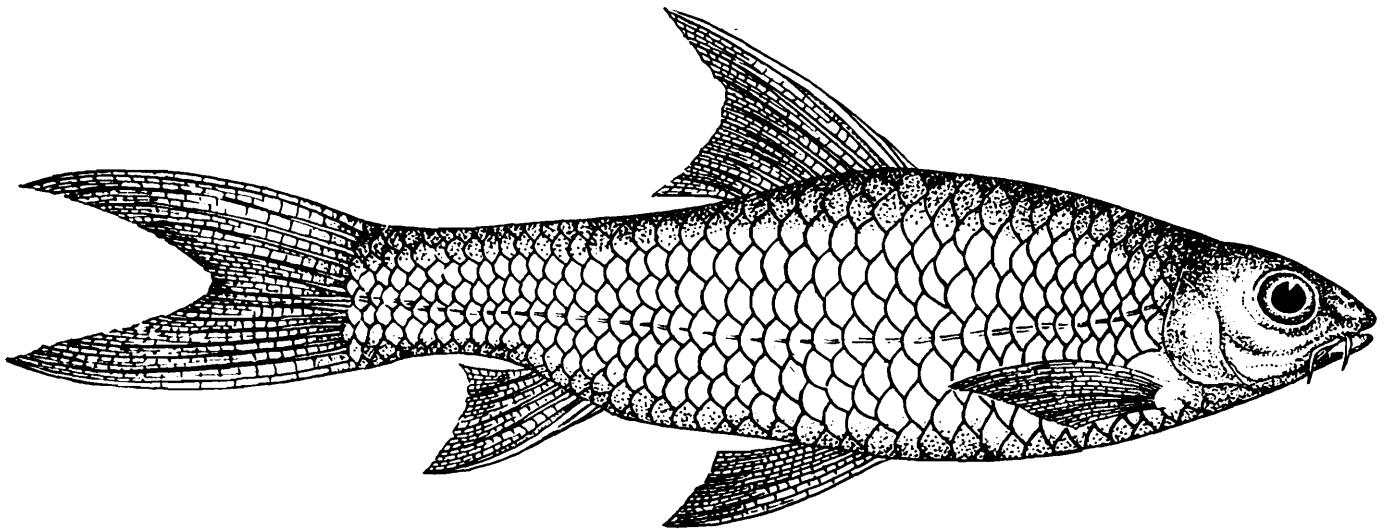
Specimens Studied : ZSI. SRS. F.2088. 3 exs., 148.0 to 158.5 mm SL, Manakka vala, Thekkady, R.S.Pillai Coll, 23.10.1975.

Diagnosis : A robust fish with pointed snout and a cartilaginous covering internally on either jaw, plain body but caudal fin median lobe white coloured, four barbels, dorsal ray weak, articulated non-osseous, lateral line complete with 38 or 39 scales.

Description : D. III, 8-9; P. 13-15; V. 1, 8-9; A. i-iii, 5-6; LL. 38-40.

Dorsal and abdominal profiles equally and moderately convex not much curved. Head 26.18 to 30.03, body depth 22.72 to 23.64 in percent of total length. Head large with pores on the preorbitin adult examples. Head width 44.84 to 48.78 height of head at occiput 62.89 to 68.49, snout 42.19 to 44.84 in percent of head length. Eyes 21.41 to 26.53 in per cent of head length, 69.44 to 78.74 in percent of interorbital width and 50.00 to 62.89 in snout length. Mouth anterior, its width less than inter-nostril distance. Lips thin. Four barbels.

Dorsal fin inserted midway between tip of snout and caudal base, its height nearly equalling body depth. Last unbranched dorsal ray non-osseous, weak and articulated. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins do not extend to pelvic fins; latter not reaching anal opening. Anal fin when laid flat reaching root of caudal fin. Least height of caudal peduncle 57.14 to 64.10 in per cent of its length. Lateral line complete.



Lateral view of *P. lithopidos*

Scales : PDS 12-14; Pre-anal 22-24; Pre-pelvic 10 to 12.

Between LL and dorsal fin base $6\frac{1}{2}$ to 7.

Between LL and pelvic fin base $3\frac{1}{2}$ to 4.

Between LL and anal fin base 4 to $4\frac{1}{2}$.

Circumpeduncular 14 to 15.

Gill Rakers : 7 + 16

Size : 600 mm TL.

Colour : Body and fins slaty, fins, caudal fin in particular, having their outer rays whitish. Pectoral fins yellowish, caudal fin greenish. Adults more yellow with a gray band behind opercle and some of the scales scarlet.

Distribution : INDIA: Karnataka, Kerala.

Relationship : Related to *P. thomassi* differing from it in colouration and squamation.

Remarks : Attains 2 feet in length and commercially important.

Additional Data

TL/Head length	21.32 to 22.37	N = 2
TL/Body depth	17.57 to 18.80	N = 2
SL/Pre dorsal	45.87 to 50.76	N = 3

SL/Pre anal	73.53 to 76.34	N = 3
SL/Pre pelvic	49.26 to 54.64	N = 3
LH/LCPD	59.52 to 62.89	N = 3
LH/HCPD	35.97 to 38.61	N = 3
LH/Dorsal fin base	51.81 to 59.17	N = 3
LH/Width of mouth	20.24 to 20.49	N = 2

The "*micropogon*" group

Six species forming two complexes constitute this group. The first one "*micropogon*" complex has four species and the second one "*carnaticus*" complex has two. Of these two, the *micropogon* complex is somewhat peculiar in that *P. kolus* shares not many common characters. It seems to have evolved as a divergent stock independently from a common *micropogon* like ancestor. A comparison is presented in Table 9.

The "*micropogon*" complex

Species :

1. *P. micropogon micropogon* (Valenciennes), 1842, p.188.
 - 1.1. *P. m. periyarensis* Raj, 1941, p.379
2. *P. dubius* (Day), 1867, p.291
3. *P. ophicephalus* (Raj), 1941, p.375
4. *P. kolus* (Sykes), 1840, p.357

Common characters :

(Exception *P. kolus*)

1. Four barbels.
2. Lateral line complete.
3. Lateral line scales 38 to 45.
4. Dorsal fin base greater than least depth of caudal peduncle.
5. Mainly restricted to Western Ghats.

Puntius micropogon micropogon (Valenciennes)

Barbus micropogon valenciennes, *Hist. Nat. Poiss.*, 16, p.188, 1842 (type locality, Mysore).- Bleeker, *Verh. Bat. Gen.*, 25, p.60, 1853.- Day, *Fish. India*, p.563, pl.138, fig.4, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.304, 1889.- Hora, *Rec. Indian Mus.*, 39(1), p.19, 1937 (Cauvery, Coorg).

Barbus gracillis Jerdon, *Madras J. Lit. & Sci.*, 15, p.313, 1849.

Barbus mysorensis Jerdon, *Madras J. Lit. & Sci.*, 15, p.312, 1849 (type locality, Cauvery river, Karanataka).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 42, p.313, 1941 (systematic status not discussed).-

Puntius gracillis, Day, *Proc. zool. Soc.*, p.290, 1867, p.290, 1890.

Barbus conirostris, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.127, 1868.

Barbus (Puntius) micropogon, Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (name only, Coorg, Wynaad, Nilgiris).

Puntius micropogon mysorensis Mukerji, *J. Bombay nat. Hist. Soc.*, 35, pp.166, 167, 1931.

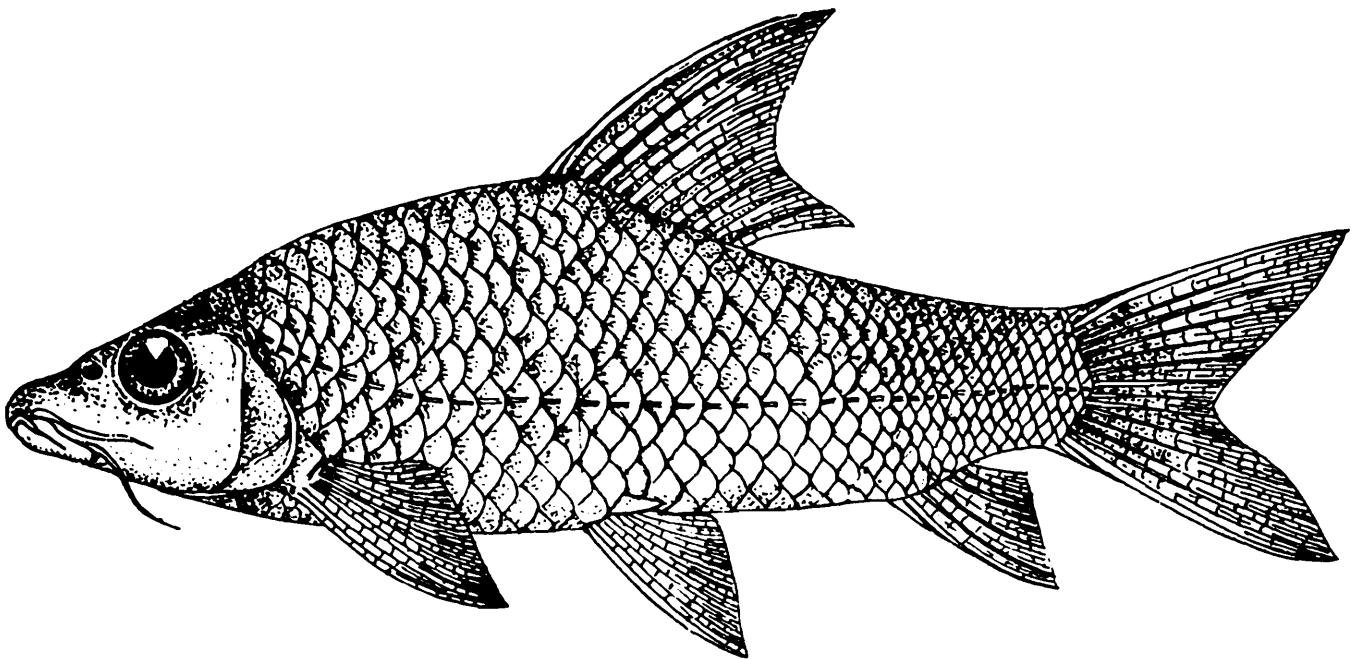
Puntius micropogon, Rajan, *J. Bombay nat. Hist. Soc.*, 53(1), pp.45, 47, 1955 (Bhavani and Moyar rivers, Nilgiri Hills, variations cited).- Rajan, *Proc. Indian Acad. Sci.*, 58, p.296, 1963 (Moyar river, Nilgiri Hills).- Jayaram, *Handbk. FW Fish. India*, p.101 (distribution), p.105 (key), 1981.- Jayaram *et al.*, *Occ. Paper zool. Surv. India*, No 36, p.61, 1982 (key, Cauvery river, S. India).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.37, 1984 (common and vernacular names).

Vernacular Names : *Coatee kendai*, Tam.

Specimens Studied : ZSI F 2305, 1 ex., 106 mm SL, Bhavani river, purchased F. Day. ZSI, SRS, Unreg. 2 exs. 73 & 155 mm SL, Wynaad, Muthanga, W. Ghats survey, R.S. Pillai coll. 10.10.76 (figd). ZSI, SRS, Unreg. 5 exs. 73 to 145 mm SL, Noolpuzha, near Muthanga forest nurscry, Wynaad, KCJ Coll. 16.2.85.

Diagnosis : A deep bodied fish without any colour bands, four barbels, dorsal ray very long, longer than body depth or head length, osseous, strong, serrated, lateral line complete. A groove like depression in front of nostril across snout present.

Description : D. II-III, 8 or 9; P. 14-16; V.i, 8; A. ii, 5; C. 15 or 16; LL. 38-41.



Lateral view of *P. micropogon micropogon*

Dorsal and ventral profiles equally arched. Head large, conical. Head length 24.53 to 28.90, body depth 27.24 to 31.81 in percent of standard length. Head width 54.94 to 59.17, height of head at occiput 59.17 to 68.96, snout 30.76 to 42.55 in percent of head length. Snout conically pointed, with pores across and also on sides. Eyes 23.07 to 33.33 in percent of head length, 74.07 to 116.27 in percent of interorbital width, 60.86 to 93.75 of snout length. Mouth subterminal, its width less than inter-nostril distance. Lips thin, plain. Two pairs of barbels.

TABLE 9

Comparison of the species of the *micropogon* group1. The *micropogon* complex2. The *carnaticus* complex

Characters	<i>P. micropogon</i> (Val.), 1842 p.188	<i>P. dubius</i> Day, 1867, p.291	<i>P. ophicephalus</i> Raj, 1941, p.375	<i>P. kolus</i> (Sykes), 1840, p.357	<i>P. carnaticus</i> (Jerdon), 1849, p.311	<i>P. bovancicus</i> (Day), 1878, p.566
1. Number of barbels	Four	Four	Two	Four	Four	Four
2. Last unbranched dorsal ray	Osseous, strong smooth, longer than BD or LH	Osseous, strong smooth	Stiff, very weak, articulated	Weakly osseous, or articulated	Osseous, strong, smooth may be longer than BD	Osseous, strong, smooth as long as BD
3. Lateral line	Complete	Complete	Complete	Complete	Complete	Complete
4. LL Scales	38 to 41	42 or 45	40 to 42	40 to 43	28 to 31	24 to 26
5. PDS	12 or 14	12 to 15	15 to 17	11 to 14	12 to 18	9 or 10
6. LL/Dorsal	5 ¹ / ₂ to 6 ¹ / ₂	8 or 9	7 to 7 ¹ / ₂	9 or 10	5 ¹ / ₂ to 6	5 ¹ / ₂
7. LL/Pelvic	3 ¹ / ₂ to 4	4 ¹ / ₂ to 5	3 ¹ / ₂ to 4	4 to 5 ¹ / ₂	3 ¹ / ₂	2 ¹ / ₂ to 3
8. LL/Anal	3 ¹ / ₂ to 4 ¹ / ₂	5 to 6 ¹ / ₂	3 ¹ / ₂ to 4	4 to 6	3 ¹ / ₂	3 ¹ / ₂ to 4 ¹ / ₂
9. Circumpeduncular	10 to 12	11 to 13	15 to 16	10 to 12	10 or 11	10 or 11
10. Pre-anal	21 to 23	22 to 26	24	24 to 29	20 to 22	16 to 18
11. Pre-pelvic	8 to 10	10 to 14	12	9 or 10	7 to 9	8 or 9
12. Gill-Rakers	5 or 6 + 13 to 16	5 or 6 + 12	4 - 6 + 10	6 + 18	3 + 8	5 or 6 + 11 or 12
13. SL/LH	3.46 to 4.08	3.68 to 4.25	3.20 to 4.00	3.70 to 4.41	3.58 to 4.67	3.44 to 4.57
14. SL/Body depth	3.14 to 3.67	3.05 to 3.83	3.80 to 4.40	3.17 to 4.00	2.71 to 3.58	2.85 to 4.09
15. LH/Eye	3.00 to 4.33	5.22 to 5.94	3.20 to 5.50	4.25 to 5.56	3.00 to 4.11	3.08 to 4.07
16. LH/Snout	2.35 to 3.25	2.00 to 2.31	3.10 to 3.25	2.10 to 2.37	2.85 to 3.57	2.57 to 3.18
17. IOW/Eye	0.86 to 1.35	2.08 to 2.27	1.20 to 2.20	1.75 to 1.92	1.14 to 1.50	1.00 to 1.76
18. Snout/Eye	1.07 to 1.64	2.26 to 2.80	1.00 to 1.75	1.79 to 2.50	1.00 to 1.43	1.00 to 1.57
19. LCPD/HCPD	1.35 to 1.82	1.43 to 1.73	1.40 to 1.81	1.59 to 1.62	1.22 to 1.50	1.08 to 1.50
20. Width of Mouth/IND	less than IND	equal to or less than IND	equal to IND	less than IND	greater than IND	equal to greater than IND
21. Dorsal fin base	greater than HCPD	greater than HCPD	greater than HCPD	greater than HCPD	greater than HCPD	greater than HCPD
22. Colour	No spots	No spots	No spots	No spots	No spots	No spots
23. Distribution	Western Ghats, in South India	Western Ghats, in South India	Western Ghats, in South India	South India Madhya Pradesh	Western Ghats, in South India	Western Ghats, in South India

Dorsal fin inserted midway between tip of snout and caudal base. Last unbranched dorsal ray osseous, strong, smooth, usually longer than head or body depth. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins do not extend to pelvics; latter not reaching anal opening. Anal fin when laid flat reaching root of caudal fin. Least depth of caudal peduncle 55.00 to 74.07 in percent of its length. Lateral line complete.

Scales : PDS 12-14; Pre-anal 21-23; Pre-pelvic 8 to 10

Between LL and dorsal fin base $5\frac{1}{2}$ to $6\frac{1}{2}$

Between LL and pelvic fin base $3\frac{1}{2}$ to 4

Between LL and anal fin base $3\frac{1}{2}$ to $4\frac{1}{2}$

Cirumpeduncular 10 to 12

Gill Rakers : 5 or 6 + 13 to 16.

Colour : Body greenish superiorly with cheeks golden, pale beneath. Base of each scale dark tinged. Fins dark along their centres.

Distribution : INDIA: Rivers at base of Nilgiris as Bhavani, Wynaad in Kerala, South Kanara, Karnataka. Introduced into Ooty Lake.

Relationships : Related to *P. carnaticus* differing in number of scales and body proportions.

Remarks : Commercially valuable, growing to a large size.

Additional Data :

TL/Head length	20.00 to 21.76	N = 5
TL/Body depth	21.05 to 24.50	N = 5
SL/Pre dorsal	49.20 to 51.11	N = 8
SI/Pre anal	73.97 to 80.00	N = 8
SL/Pre pelvic	49.03 to 57.51	N = 8
LH/LCPD	57.50 to 70.37	N = 7
LH/HCPD	38.09 to 42.59	N = 7
LH/Dorsal fin base	59.25 to 65.38	N = 7
LH/Width of Mouth	15.38 to 25.00	N = 8

Puntius micropogon periyarensis Raj

Puntius micropogon periyarensis Raj, *Rec. Indian Mus.*, 43, p.379, 1941 (type locality, Periyar valley, Kerala).

Barbus (Puntius) micropogon periyarensis, Menon & Yazdani, *Rec. zool. Surv. India*, 61(1 & 2), p.105, 1968 (Holotype & Paratype in Zoological Survey of India).

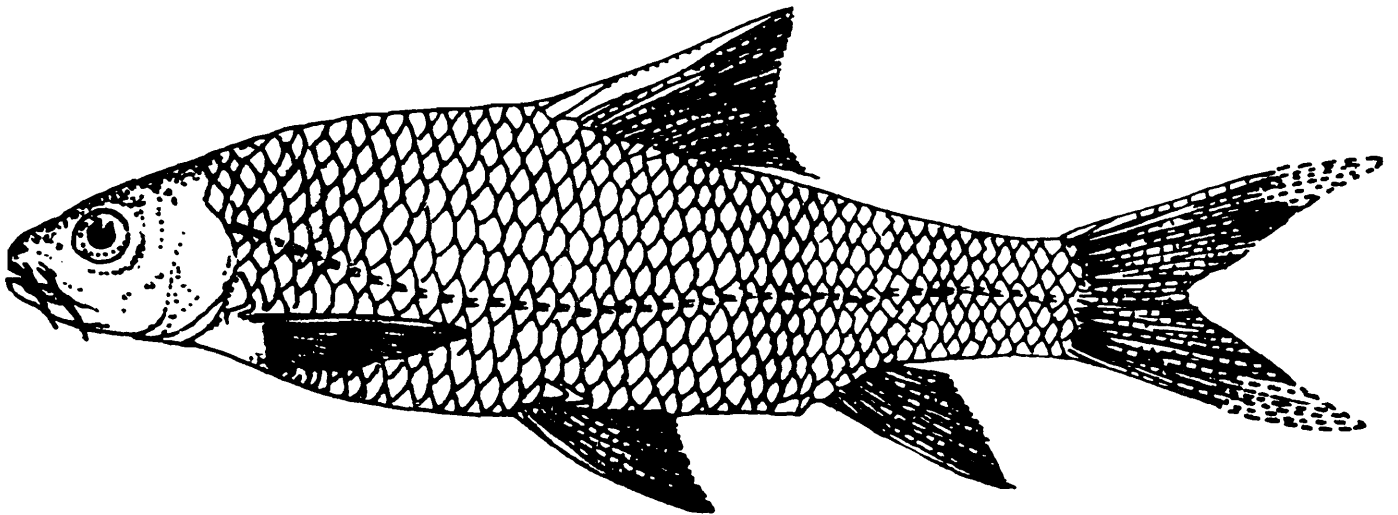
Vernacular Names : *Karivan*, Tamil (=Charcoal coloured).

Specimens Studied : F.13517/1, ZSI, 1 ex, Paratype, 121 mm SL, Periyar Lake, Kerala.

Diagnosis : A moderately deep bodied fish without bands and 4 barbels, serrated long dorsal spine, longer than head length and body depth, complete lateral line and with 42 or 43 scales.

Description : D. III-IV, 7 to 9; P.i, 13-16; V.i-ii, 8, A. ii-iii, 5; C. 17 to 19; LL. 42-43.

Dorsal and ventral profiles arched. Head small, conical and somewhat depressed. Head length 22.22 to 23.38; body depth 30.30 to 31.25 in percent of standard length. Head width 60.98 to 64.10, height of head at occiput 62.50 to 68.02, snout 32.26 to 34.01 in percent of head length. Snout conical, bluntly pointed, without any free lateral lobes. Eyes large, visible when viewed from below ventral surface, 18.18 to 32.26 in percent of head length, 68.96 to 100.00 in percent of snout length, 58.14 to 90.90 of interorbital space width. Width of mouth greater than inter-nostril distance. Lips moderately developed. Two pairs of barbels.



Lateral view of *P. micropogon periyarensis*

Dorsal fin inserted between tip of snout and caudal base. Last unbranched ray osseous, smooth, strong, much enlarged. Dorsal fin base greater than height of caudal peduncle. Pectoral fins do not extend to pelvic fins; latter do not reach anal opening. Anal fin when laid flat reaching root of caudal fin. Least height of caudal peduncle 57.47 to 76.92 in percent of its length. Lateral line complete.

Scales : PDS 19-21; Pre-anal 28; Pre-pelvic 13

Between LL and dorsal fin base	6
Between LL and pelvic fin base	3½ to 4
Between LL and anal fin base	3½
Circumpeduncular	14 to 16

Gill Rakers : 5 + 13

Size : 200 mm SL

Colour : Head and body dark brown or blackish, fins stained black.

Distribution : INDIA: Periyar Lake, Kerala.

Relationships : Close to *P. dubius* from which it differs as detailed in Table 10.

TABLE 10
Comparison of *P. micropogon* with *P. dubius*

Characters	<i>P. micropogon micropogon</i>	<i>P. micropogon periyarensis</i>	<i>P. dubius</i>
1. SL/LH	3.46 to 4.08	4.28 to 4.50	3.68 to 4.25
2. Snout	Blunt	Pointed	Pointed
3. Anal fin	Extends to caudal fin base	Not extending to caudal fin base	Extending to caudal fin base
4. LL Scale	38 to 41	42 or 43	42 to 45
5. PDS	12 to 14	19 to 21	12 to 15
6. L. Tr.	7-8 ¹ / ₂	7/7	8-9 ¹ / ₂ -5

Additional Data : (Paratype one ex. only)

TL/Head length	17.83
TL/Body depth	21.66
SL/Pre dorsal	52.48
SL/Pre anal	78.51
SL/Pre pelvic	51.24
LH/HCPD	82.14
LH/HCPD	48.21
LH/Dorsal fin base	73.21
LH/Width of Mouth	25.00

Puntius dubius Day

Puntius (Barbodes) dubius Day, *Proc. zool. Soc. Lond.*, p.291, 1867 (type locality, Bhavani river at base of Nilgiris).

Barbus dubius, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.127, 1868.- Day, *Fish. India*, p.562, pl.137, fig.1, 1878.- Day, *Fauna Brit India, Fish.*, 1, p.303, 1889.- Hora, *Rec. Indian Mus.*, 39, p.19, 1937 (Cauvery river, Coorg).- Hora, *Thapar Comm. Vol.*, p.132, 1953.- Raj, *Rec. Indian Mus.*, 43, p.384, 1941 (name only; specimens from Bhavani river, Cauvery, Coorg; Cauvery at Mettur Dam compared).

Barbus (Puntius) dubius, Hora, *Rec. Indian Mus.*, 44, p.195, 1942 (name only, distribution, Coorg, Nilgiris).

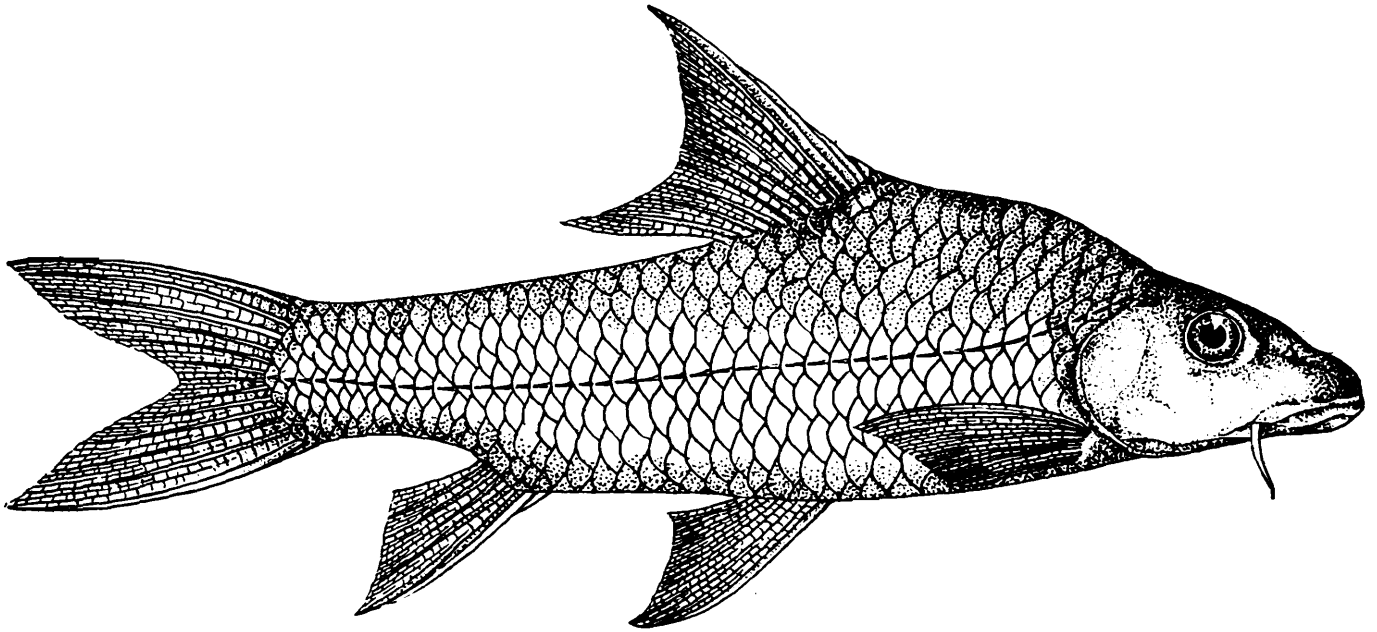
Puntius dubius, Rajan, *J. Bombay Nat. Hist. Soc.*, 53(1), p.45, 1955 (name only, Bhavani and Moyar rivers, Nilgiri Hills).- Rajan, *Proc. Indian Acad. Sci.*, 58, p.296, 1963 (Moyar river, Nilgiri Hills).- Jayaram, *Handbk. FW. Fish. India*, p.100 (distribution), p.105 (key), 1981.- Jayaram *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.57, 1982 (key, Cauvery river, S. India).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.37, 1984 (common & vernacular names).

Vernacular Names : Oorlu, Kan; Kozhi meen, Kozhi arinjan kendai, Tam.

Specimens Studied : ZSI SRS Unreg. 3 exs., 238-272 mm SL, River Cauvery at Hogenaikal. KCJ Coll. ZSI SRS Unreg, 2 exs., 114-117 mm SL, River Coleroon at Upper Anaicut, KCJ. coll.

Diagnosis : A robust deep bodied carp without colour bands or spots with four barbels, 42 to 45 scales along lateral line, $4\frac{1}{2}$ to 5 between lateral line and pelvic base and a strong smooth dorsal spine nearly equal to head length. Scales dark tinged at base.

Description : D. III, 8-9; P. i, 15-18; V.i, 9; A. ii-iii, 5-6; C. 15-17; LL. 42-45.



Lateral view of *P. dubius*

Dorsal profile more convex than ventral. Head large, conical. Head length 23.53 to 27.19, body depth 26.10 to 32.77 in percent of standard length. Head width 51.56 to 58.33, height of head at occiput 64.52 to 69.17, snout 43.33 to 50.00 in percent of head length. Snout conical, somewhat elevated with pores on sides. Eyes superior, moderate, 16.84 to 19.17 in percent of head length, 44.00 to 48.10 in percent of interorbital width and 35.71 to 44.23 of snout length. Mouth subterminal, its width equal to or less than inter-nostril distance. Lips thick, not papillated. Two pairs of barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray osseous, strong, smooth. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvics; latter not reaching anal opening. Anal fin when laid flat just reaching root of caudal fin. Least depth of caudal peduncle 57.69 to 70.00 in percent of its length. Lateral line complete.

Scales : PDS 12-13; Pre-pelvic 10-14; Pre-anal 23-26.

Between LL and dorsal fin base	8-9
Between LL and pelvic fin base	$4\frac{1}{2}$ - 5
Between LL and anal fin base	$5-6\frac{1}{2}$
Circumpeduncular	11 to 13

Gill Rakers : 5 or 6 + 12

Size : 300 mm TL

Colour : Uniformly silvery with bases of scales dark tinged.

Distribution : INDIA: Cauvery river and its tributaries as Bhavani in Karnataka, Tamil Nadu, common in the hilly regions than in plains.

Relationships : Related to *P. micropogon* differing from it in scale counts and length of dorsal spine.

Additional Data :

TL/Head length	19.96 to 21.19	N = 3
TL/Body depth	20.13 to 21.19	N = 3
SL/Pre dorsal	44.12 to 47.50	N = 5
SL/Pre anal	62.50 to 78.95	N = 5
SL/Pre pelvic	46.67 to 51.26	N = 5
LH/LCPD	64.52 to 86.67	N = 5
LH/HCPD	42.10 to 51.50	N = 5
LH/Dorsal fin base	54.74 to 62.50	N = 5
LH/Mouth width	15.00 to 23.44	N = 5

***Puntius ophicephalus* Raj**

Barbus (Puntius) ophicephalus Raj, *Rec. Indian Mus.*, 43, p.375, 1941 (type locality, Kallar river, Pachakani estate, Periyar Lake).- Menon & Yazdani, *Rec. zool. Surv. India*, 61(1 & 2), p.106, 1968 (syntypes in ZSI).

Vernacular Names : *Echathalai kendai*, Tamii.

Specimens Studied : ZSI, F.13515/1, 1 ex., 88 mm SL, Kallar river, North Travancore, B.S. Raj coll.

Diagnosis : An elongated fish *Channa* like in appearance, with four barbels, dorsal ray stiff, articulated and lateral line complete with 40-42 scales.

Description : D. III, 7; P. i, 13-15; V i, 8; A. ii-iii, 5; C. 17-19; LL. 40-42.

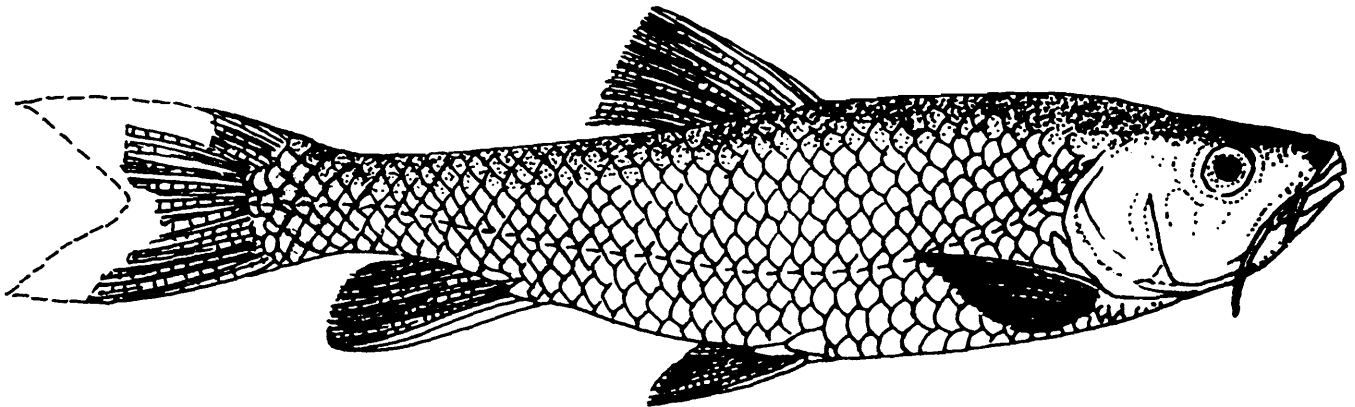
Dorsal profile slightly more arched than ventral, it is convex from tip of snout to dorsal fin and straight behind the fin. Head length 25.00 to 31.25, body depth 22.73 to 26.31 in percent of standard length. Head width 53.76 to 68.03, height of head at occiput 58.00 to 69.44, snout 30.77 to 32.26 in percent of head length. Snout somewhat prominent, broadly rounded anteriorly. Eyes large, elevated in anterior half of head, just visible from below ventral surface, 18.18 to 31.25 in percent of head length, 45.45 to 83.33 in percent of interorbital width and 57.14 to 100.00 of snout length. Mouth subinferior, horse-shoe shaped, width of mouth equal to inter-nostril distance. Lips papillated in some examples, thick. Two pairs of barbels.

Dorsal fin inserted nearer tip of snout than caudal fin base. Last unbranched dorsal ray stiff, slightly enlarged but very weak, smooth, articulated in its upper part. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat reaching root of caudal fin. Least depth of caudal peduncle 55.17 to 71.43 in percent of its length. Lateral line curved and complete.

Scales : PDS 15-17; Pre-anal 24; Pre-pelvic 12.

Between LL and dorsal fin base	7 to 7½
Between LL and pelvic fin base	3½ to 4
Between LL and anal fin base	3½ to 4
Circumpeduncular	15 or 16

Gill Rakers : 4 to 6 + 10



Lateral view of *P. ophicephalus*

Size : 196 mm TL

Colour : In fresh examples the back and fins are golden brown, sides and abdomen silvery brown. A broad dark band runs along the lateral line composed of fine black spots on the bases of lateral line scales.

Distribution : INDIA: Kallar, a tributary of Pambiyar river, South of Pachakani estate, adjoining Periyar Lake, Kerala.

Relationships : Close to *P. lithopidos*, differing from it in the lips not having a cartilaginous covering, greater number of LL scales and colouration. *P. lithopidos* is more northern in the W. ghats unlike *P. ophicephalus* which is in the south.

Additional Data :

TL/Head length	24.75
TL/Body depth	19.80
SL/Pre dorsal	48.86
SL/Pre anal	76.14
SL/Pre pelvic	51.14
LH/LCPD	58.00
LH/HCPD	32.00
LH/Dorsal fin base	48.00
LH/Mouth width	24.00

Puntius kolus (Sykes)

Barbus kolus Sykes, *Trans. zool. Soc. Lond.*, 2, p.357, pl.62, fig.1, 1840. - (type locality, Mota Mola river, 8 miles east of Poona). Gunther, *Cat. Fish. Brit. Mus.*, 7, p.136, 1868. - Annandale, *Rec. Indian Mus.*, 16, p.125, 1919 (streams of Bombay presidency). - Day, *Fish. India*, p.573, pl.141, fig.2, 1878. - Day, *Fauna Brit. India, Fish.*, 1, p.319, 1889. - Hora, *Rec. Indian Mus.*, 39(1), p.7 (Tunga river at Shimoga), 8 (Bangalore), 19 (Cauvery river, Coorg), 1937. - Hora & Misra, *J. Bombay nat. Hist. Soc.*, 39(3), pp.505, 508, 516, 518 (Darna river), 507 (Wadi river), 510 (Aounda river), 512, 517 (Lake Beale), 1937. - Hora & Misra, *J. Bombay nat. Hist. Soc.*, 40(1), p.28, pl.1, fig.1, 1938 (Deolali). - Hora, *J. Bombay nat. Hist. Soc.*, 43(2), pl.2, fig.b, 1942. - David, *Proc. nat. Inst. Sci. India*, 22B(3), p.152, 1956 (Bhadra river at Bhadravati). -

Capoeta kolus, Bleeker, *Verh. Bat. Gen.*, 25, p.62, 1853.

Hypselobarbus (Gonoproktopterus) kolus, Bleeker, *Nat. Tijdschr. Dierk.*, 20 p.275, 1860.

Barbus guentheri Day, *Proc. zool. Soc. Lond.*, p.582, 1868.

Barbus (Puntius) kolus, Hora, *Rec. Indian Mus.*, 44, p.195, 1942 (name only, Coorg, Wynaad, Nilgiris). - Hora & Misra, *J. Bombay nat. Hist. Soc.*, 43(2), p.220, 1942 (Poona).

Puntius kolus Silas, *J. Bombay nat. Hist. Soc.*, 51, p.581 1953 (Krishna river at Wai, Maharashtra). - Misra, *Rec. Indian Mus.*, 57(1-4), p.154, 1962 (brief description). - Jayaram, *Hnadbk. FW. Fish. India*, p.101 (distribution), p.107 (key), 1981. - Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56 p.37, 1984 (common and vernacular names).

Vernacular Names : *Kolis, Kelashi, Kolshi, Mar; Nilusu, Tel.*

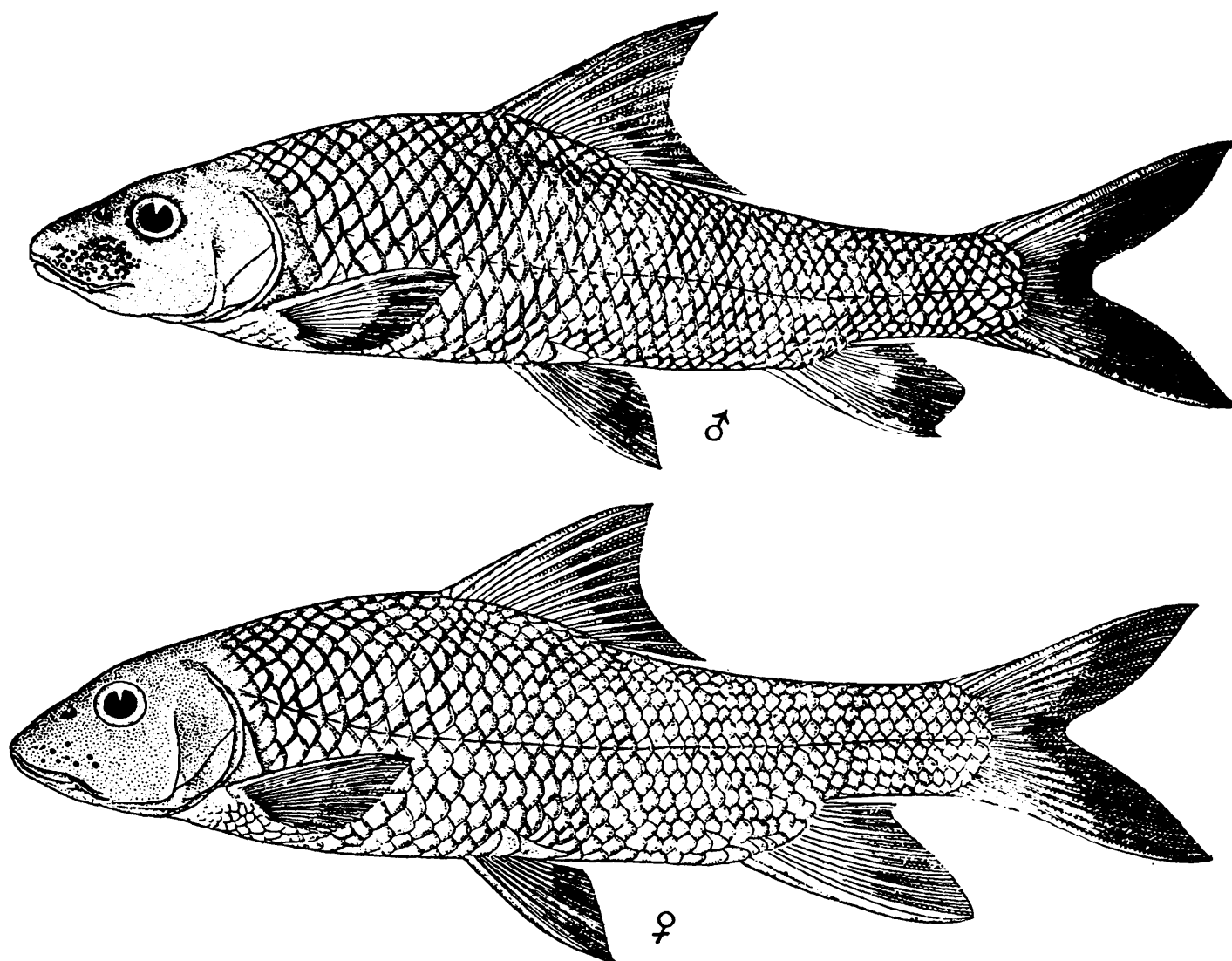
Specimens Studied : ZSI, SRS (Unregd.), 3 exs., 190-225 mm SL, Nizamsagar, Andhra Pradesh, T. Venkateswarlu coll. ZSI, SRS (Unregd.), 1 ex., 180 mm SL, Muddeibihal fish market, Bijapur district, Karnataka, purchased KCJ coll. 24.12.1987. ZSI, SRS (Unregd.), 5 exs., 120-154 mm SL, River Krishna at Mahuli Village, Satara district, Maharashtra, KCJ coll. 1.1.1988. ZSI, SRS (Unregd.), 3 exs., 168-198.5 mm SL, Venna river, near Kankera, Satara district, Maharashtra, KCJ coll. 1.1.1988. ZSI, SRS (Unregd.), 2 exs., 150 and 163 mm SL, River Krishna at Haripur, Sangli, Satara district, KCJ coll. 28.12.1987.

Diagnosis : A large sized fish with a deep body, without any colour bands, two barbels, dorsal ray weakly osseous, articulated, lateral line complete with 40 to 43 scales. Snout conical with tubercles.

Description : D. III-IV, 9; P. 15; V. i, 8; A. ii-iii, 5; C. 19; LL. 40-43.

Dorsal profile with a considerable rise from the occiput to the dorsal fin. Head large, obtuse. Head length 22.67 to 28.33, body depth 23.53 to 31.54 in percent of standard length. Head width 46.08 to 73.53, height of head at occiput 63.39 to 83.33, snout 42.19 to 47.62 in percent of head length. Snout with horny tubercles in adult males, females have a few only. Eyes superior, 17.30 to 26.32 in percent of head length, 42.92 to 70.92 in percent of interorbital width, 39.06 to 62.50 of snout length. Mouth thin, not papillated. One pair of barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray weakly osseous, or articulated, dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat reaching root of caudal fin. Least depth of caudal peduncle 50.00 to 69.93 in percent of its length. Lateral line inconspicuous in preserved examples but complete.



Lateral view of male and female of *P. kolus*

Scales : PDS 11-14; Pre-anal 24-29; Pre pelvic 9 or 10.

Between LL and dorsal fin base 9 or 10.

Between LL and pelvic fin base 4 to 5½

Between LL and anal fin base 4 to 6

Circumpeduncular 10 to 12

Gill Rakers : 6 + 18.

Size : 300 mm TL and above.

Colour : Silvery with a tinge of yellow, dorsal, anal, caudal fins tipped with grey.

Distribution : INDIA: Madhya Pradesh, Cauvery, Krishna, Godavari river systems in South India.

Relationships : Distantly related to *P. dubius*, *P. micropogon* differing from them in having less number of barbels, a weak dorsal ray and other features.

Remarks : *P. kolus* was described by Sykes (1838) along with two other species *B. mussullah* and *B. khudree*; of these three *kolus* is distinct from the other two by having only one pair of barbels and an interrupted labial groove. *P. kolus* however resembles more *P. mussullah* than *khudree* though the latter two are now referable to the genus *Tor*.

P. kolus and *T. mussullah* share certain common features such as a deep body, a conical snout and the males possessing horny tubercles or pearl organs. The last cited character of course is common to *khudree* and a few other species also. Hora & Misra (1938) clearly demonstrated after examination of a very large number of specimens that in the adult males of *kolus*, patches of well developed tubercles are present on the sides of the snout, on certain rays of the anal fin and in the lower half of the caudal fin. In the case of females only a few small tubercles are sometimes present on the sides of the snout. Moreover, in the males the body is proportionally less deep, head longer and more pointed; the dorsal fin more concave and the outer rays of the anal fin are short, so that the median rays form a lobe in the middle of the fin.

Sykes (1838) and Gunther (1868) also made reference to these tubercles but Day (1878) did not; probably the specimens before him were immature.

Additional Data :

TL/Head length	17.39 to 22.02	N = 14
TL/Body depth	20.66 to 29.15	N = 14
SL/Pre dorsal	44.44 to 53.76	N = 14
SL/Pre anal	74.63 to 87.72	N = 14
SL/Pre pelvic	50.00 to 54.95	N = 14
LH/LCPD	51.28 to 86.21	N = 14
LH/HCPD	29.85 to 54.94	N = 14
LH/Dorsal fin base	49.02 to 78.43	N = 14
LH/Width of mouth	16.00 to 26.45	N = 14

The "Carnaticus" complex

Species :

1. *P. carnaticus* (Jerdon), 1849, p.311
2. *P. bovanicus* (Day), 1878, p.566

Common characters :

1. Four barbels.
2. Dorsal spine osseous, strong, may be as long as body depth or longer than that.

3. Lateral line complete.
4. Lateral line scales 24 to 31.
5. Circumpeduncular scales 10 or 11.
6. Dorsal fin base greater than least depth of caudal peduncle.
7. Restricted to Western Ghats in South India.

***Puntius carnaticus* (Jerdon)**

“Carnatic Carp”

Barbus carnaticus Jerdon, *Madras J. lit. & Sci.*, 15, p.311, 1849.- Gunther, *Cat. Fish. Brit. Mus.*, 7, p.128, 1868.- Day, *Fish. India*, p.563, pl.137, fig.3, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.305, 1889.

Puntius (Barbodes) carnaticus, Day, *Proc. zool. Soc. Lond.*, p.292, 1867.- Ammandale, *Rec. Indian Mus.*, 16, p.135, 1919.

Barbus (Puntius) carnaticus, Hora, *Rec. Indian Mus.*, 44, p.195, 1942 (name only, distribution “Nilgiris, Wynad, Mysore and S. Canara”).- Silas, *J. Bombay Nat. Hist. Soc.*, 49(4), p.673 (Calparai, Vannamadi Bridge, Ponnani drainage), p.675 (notes), 1951.

Puntius carnaticus, Rajan, *J. Bombay Nat. Hist. Soc.*, 53(1), pp.45, 46, 1955 (name only, Bhavani and Moyar rivers, Nilgiri hills, details of juvenile example given).- Misra, *Rec. Indian Mus.*, 57(1-4), p.152, 1962 (brief description).- Rajan, *Proc. Indian Acad. Sci.*, 58, p.296, 1963 (Moyar river, Nilgiri Hills).- Jayaram, *Handbk. FW. Fish. India*, p.99 (distribution), p.104 (key), pl. iv. fig. A, 1981.- Jayaram, *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.52, 1982 (key, Cauvery river, S. India, sexual dimorphism noted).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.36, 1984 (Common and vernacular names).

Vernacular Names : *Gidapakke, Gendai*, Kan; *Giddi kaoli*, Hind; *Kavery kenta*, Mal; *Pooree candee, Saal candee, Shellee, Pauvri kendai, Pourea, Pulli kendai, Sall kendai*, Tam.

Specimens Studied : ZSI, SRS, Unreg. 1 ex. 245 mm SL, Cauvery river, KCJ coll. 1973. ZSI, SRS, Unreg. 13 exs., 46.0 to 182.0 mm SL., R. Kabbini, Nanjangud, Karnataka, KCJ coll. 13.10.75. ZSI, SRS, Unreg. 1 ex., 73.5 mm SL., R. Ulubela at Sivasmuddram, Karnataka, KCJ coll. 17.10.75. ZSI, SRS, Unreg. 2 exs., 90.00 & 93.50 mm SL., R. Hemavathy at Hole Narsipur, KCJ coll. 6.10.75. ZSI, SRS, Unreg. 2 exs., 86.0 to 87.5 mm SL., Noolpuzha near Muthanga forest nursery, 16.2.85., KCJ coll. Feb. 1985.

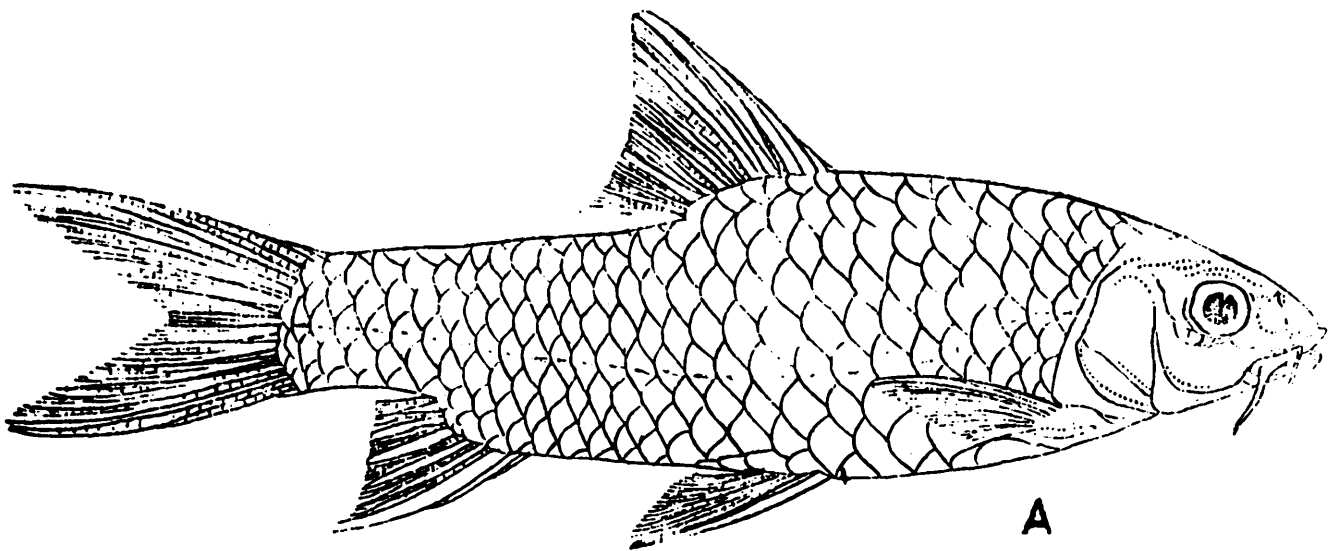
Diagnosis : A deep bodied fish with no colour bands or spots on body, with four barbels, dorsal ray osseous, strong, smooth, longer than head length, lateral line complete with 28 to 31 scales.

Description : D. III-IV, 8; P.15; V. i, 8; A. ii, 5; C. 19; LL. 28-31.

Dorsal and ventral profiles equally arched upto posterior end of dorsal fin. Head short, rounded. Head length 21.41 to 27.95, body depth 27.95 to 36.90 in percent of standard length. Head width 48.00 to 65.22, height of head at occiput 69.23 to 81.50, snout length 28.00 to 35.13 in percent of head length. Snout obtusely rounded, plain. Eyes large, superior, 24.32 to 33.34 in percent of head length, 66.67 to 87.71 in percent of interorbital width and 69.93 to 100.00 of snout length. Mouth subterminal, its width greater than inter-nostril distance. Lips thick, but not papillated. Two pairs of barbels.

Dorsal fin inserted midway between tip of snout and caudal base. Last unbranched dorsal ray osseous, strong, smooth, occasionally longer than body depth. Dorsal fin base

greater than least depth of caudal peduncle. Pectoral fins not extending to pelvics; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 66.66 to 82.14 in percent of its length. Lateral line complete.



Lateral view of *P. carnaticus*

Scales : PDS 12-18; Pre anal 20-22; Pre-pelvic 7-9

Between LL and dorsal fin base $5\frac{1}{2}$ -6

Between LL and pelvic fin base $3\frac{1}{2}$

Between LL and anal fin base $3\frac{1}{2}$

Circumpeduncular 10-11

Gill Rakers : 3 + 8

Size : 600 mm TL

Colour : Greenish brown along back, becoming dull white, glossed with gold on sides and beneath. Fins greyish. Eyes golden.

Distribution : INDIA: Cauvery, Krishna river systems, Nilgiris, Wynaad in Kerala and Kanara in Karnataka.

Relationships : Close to *P. micropogon* differing from it in having less number of scales and body proportions.

Remarks : Rajan (1955) stated that the juveniles have a clear dark precaudal spot extending over the penultimate lateral line scale and that the fish though introduced by Day (1889) into Ooty Lake has not survived there.

Additional Data :

TL/ Head length	18.18 to 24.57	N = 14
TL/Body depth	20.92 to 27.66	N = 13
SL/Pre dorsal	48.59 to 54.76	N = 20

SL/Pre anal	70.42 to 80.64	N = 20
SL/Pre pelvic	42.91 to 55.43	N = 20
LH/LCPD	58.82 to 78.20	N = 18
LH/HCPD	43.47 to 64.93	N = 19
LH/Dorsal fin base	53.85 to 71.74	N = 18
LH/Width of mouth	19.56 to 30.48	N = 19

***Puntius bovanicus* (Day)**

Barbus bovanicus Day, *Fish. India*, p.566, pl.138, fig.1, 1878 (type locality, Bhavani river at base of Nilgiri Hills).- Day, *Fauna Brit. India, Fish.*, 1, p.308, 1889.-

Puntius bovanicus, Jayaram, *Handbk. FW. Fish. India*, p.99 (distribution), p.105 (key).- Jayaram, *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.51, 1982 (key Topotypes recorded, Cauvery, S. India).

Vernacular Names : *Bhavani kendai*, Tam.

Specimens Studied : ZSI F.2384, Holotype, 72 mm SL, Bhavani river, Nilgiris, F. Day purchased. ZSI, SRS, Unreg. 6 exs., 74.0 to 107 mm SL, Aiyar Channel, Cauvery river, Vathalai, KCJ Coll. 6.2.1974. ZSI, SRS, Unreg. 1 ex., 118.5 mm. SL, R. Cauvery at Jedarpalayam, KCJ coll., 6.4.73. ZSI, SRS, Unreg. 1 ex., 161 mm SL, R. Cauvery at Erode, purchased from fish market, T. Venkateswarlu, 15.2.74. ZSI, SRS, Unreg. 1 ex., 194 mm SL, R. Cauvery at Kulithalai, KCJ COLL., 2.4.73.

Diagnosis : A moderately deep bodied fish, without any bands or spots, four barbels, dorsal ray osseous, strong; smooth, as long as body depth or slightly shorter. Lateral line complete with 24 to 26 scales.

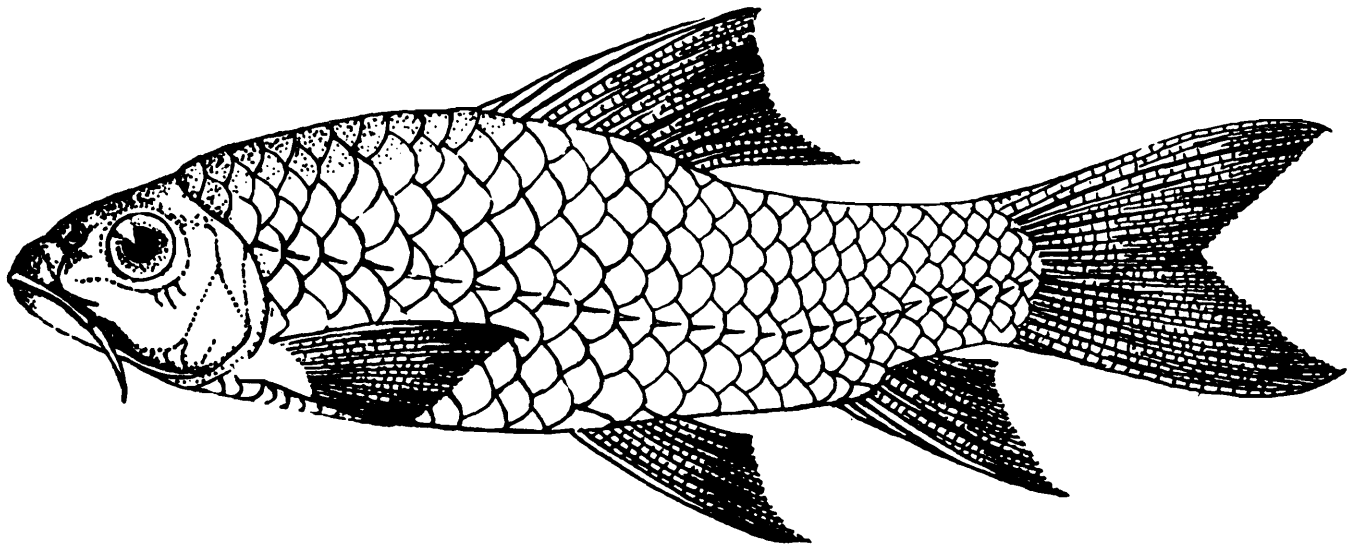
Description : D. iii, 9; P. 17; V. i, 8; A. iii, 5; C. 19; LL. 24-26.

Dorsal profile somewhat more convex than ventral. Head moderate. Head length 21.90 to 29.05, body depth 24.47 to 35.13 in percent of standard length. Head width 52.46 to 78.82, height of head at occiput, 68.85 to 87.05, snout 31.48 to 38.82 in percent of head length. Eyes 24.59 to 32.50 in percent of head length, 56.76 to 100.00 in percent of interorbital width and 63.64 to 100.00 of snout length. Mouth subterminal its width equal to or greater than inter-nostril distance. Lips thin, plain, lower labial fold complete in the adult, with a moderately developed median lobe which is not apparent in juveniles. Two pairs of barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched ray osseous, strong, smooth as long as body depth below it or slightly shorter than it. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins extend to pelvic fins; latter not reaching anal opening. Anal fin when laid flat reaching root of caudal fin. Least depth of caudal peduncle 66.67 to 92.59 in percent of its length. Lateral line complete.

Scales : PDS 9 or 10; Pre anal 16 to 18; Pre-pelvic 8 or 9

Between LL and dorsal fin base	5 $\frac{1}{2}$
Between LL and pelvic fin base	2 $\frac{1}{2}$ to 3
Between LL and anal fin base	3 $\frac{1}{2}$ to 4 $\frac{1}{2}$
Circumpeduncular	10 or 11

Lateral view of *P. bovanicus*

Gill Rakers : 5 or 6 + 11 or 12

Size : 125 mm TL.

Colour : Greenish with a golden tinge, darkest along back.

Distribution : INDIA: Bhavani river, Cauvery and its tributaries at base of Nilgiri Hills, Tamil Nadu.

Relationships : Related to *P. carnaticus* distantly, differing from it in squamation and other characters.

Additional Data :

TL/Head length	16.93 to 21.48	N = 9
TL/Body depth	19.04 to 25.49	N = 9
SL/Pre dorsal	47.67 to 54.05	N = 9
SL/Pre anal	69.62 to 80.30	N = 9
SL/Pre pelvic	47.67 to 57.07	N = 9
LH/LCPD	58.14 to 67.50	N = 9
LH/HCPD	45.28 to 58.82	N = 9
LH/Dorsal fin base	52.73 to 70.54	N = 9
LH/Width of mouth	20.00 to 28.23	N = 8

The “sarana” group

This group is divisible into two (1) *sarana* (2) *binotatus* complexes, though the second one is not so cohesive as the first. But it is apparent that a *sarana* - like ancestor has given rise to *binotatus* complex, though *P. compressiformis* seems to be a divergent off shoot. A comparison is presented in Table 11.

TABLE 11

Comparison of the species of the *sarana* group1. The *sarana* complex2. The *binotatus* complex

Characters	<i>P. sarana sarana</i> (Ham), 1822 pp.307, 388	<i>P. jayarami</i> V. & T Singh, 1986 p.129	<i>P. binotatus</i> (Val.), 1842 p.168	<i>P. roseipinnis</i> (Val.), 1842, 169	<i>P. compressiformis</i> (Cockerall), 1913 p.133	<i>P. pleurotaenia</i> Bleeker, 1863, p.242
1. Number of barbels	Four	Four	Four	Four	Four	Four
2. Last unbranched dorsal ray	Osseous, strong serrated	Osseous, strong serrated	Osseous, strong serrated	Osseous, strong serrated	Osseous, strong, serrated	Osseous, strong serrated
3. Lateral line	Complete	Complete	Complete	Complete	Complete	Complete
4. LL Scales	26 to 34	28 or 32	23 to 27	22	35 to 37	26 to 30
5. PDS	10 or 11	10	8 to 10	7 or 8	18	8 to 10
6. LL/Dorsal	5 ¹ / ₂ or 6	4 ¹ / ₂	4 to 4 ¹ / ₂	4 ¹ / ₂	6 ¹ / ₂	4 to 4 ¹ / ₂
7. LL/Pelvic	3 ¹ / ₂ to 4 ¹ / ₂	2 ¹ / ₂ to 3 ¹ / ₂	2 to 2 ¹ / ₂	2 ¹ / ₂	3	2 ¹ / ₂
8. LL/Anal	4 ¹ / ₂	2 ¹ / ₂	2 ¹ / ₂	3 ¹ / ₂	3 ¹ / ₂	2 ¹ / ₂ to 3
9. Circumpenduncular	7 or 8	9 to 12	10 to 12	9	12	10
10. Pre-anal	16	15 to 18	11 to 14	16 or 17	22	15 to 17
11. Pre-pelvic	6	7 or 9	5 to 7	8 or 9	10	7 to 10
12. Gill-Rakers	2 or 3 + 3 to 8	2 + 16	5 + 12	3 + 9 or 10	—	0 + 12
13. SL/LH	2.30 to 3.71	4.60	3.09 to 3.79	2.96 to 3.46	3.30 to 3.75	3.50
14. SL/Body depth	1.60 to 3.00	3.31	2.59 to 2.92	2.92 to 3.13	3.50 to 3.70	3.18 to 3.29
15. LH/Eye	3.27 to 4.77	3.69 to 4.71	3.05 to 3.70	3.37 to 3.73	4.00 to 4.50	3.33
16. LH/Snout	2.85 to 3.80	2.80 to 3.17	3.00 to 3.27	3.86 to 4.31	—	2.67 to 3.00
17. IOW/Eye	1.38 to 1.83	1.37 to 1.78	1.11 to 1.20	1.20	1.00	1.00 to 1.08
18. Snout/Eye	1.40 to 1.33	1.23 to 1.67	1.10 to 1.22	0.87 to 0.88	—	1.00 to 1.35
19. LCPD/HCPD	1.22 to 2.00	1.15 to 1.44	1.05 to 1.44	1.26 to 1.48	—	1.44 to 1.75
20. Width of Mouth/IND	greater than IND	greater than or equal to IND	greater than IND	greater than IND	greater than IND	greater than IND
21. Dorsal fin base	equal to or greater than HCPD	greater than HCPD	equal to HCPD	greater than HCPD	greater than HCPD	greater than HCPD
22. Colour	A finger like spot on tail	No spot on tail	A black spot at base of anal	No spot on tail	No spot on tail	No spot on tail
23. Distribution	Wide	Manipur	Burma	Pondicherry	Burma	Sri Lanka

Common characters :

1. Four barbels.
2. Dorsal spine strong, serrated.
3. Lateral line complete.
4. LL/Pelvic not more than 4 1/2 scales.
5. Circumpeduncular scales not more than 12 (7 to 12).
6. Pre-pelvic scales not more than 10 (5 to 10).
7. Width of mouth greater than inter-nostril distance.
8. Dorsal fin base equal to or greater than least depth of caudal peduncle.

***Puntius sarana sarana* (Hamilton)**

- Cyprinus sarana* Hamilton, *Fish. Ganges*, pp.307, 388, 1822 (type locality, Gangetic System, Bengal).
- Systomus immaculatus* McClelland, *Asiat. Res.*, 19, pp.284, 380, 381, 1839.- Valenciennes, *Hist. Nat. Poiss.*, 16, p.409, 1842.- Bleeker, *Verh. Bat. Gen.*, 25, p.62, 1853.
- Systomus chrysosomus* McClelland, *Asiat. Res.*, 19, p.284, 1839.- Valenciennes, *Hist. Nat. Poiss.*, 16, p.409, 1842.
- Barbus deliciosus* McClelland, *Asiat. Res.*, 19, pp.272, 342, 1839.- Valenciennes, *Hist. Nat. Poiss.*, 15, p.172, 1840.- Bleeker, *Verh. Bat. Gen.*, 25, p.60, 1853.
- Barbus kakus* Valenciennes, *Hist. Nat. Poiss.*, 16, p.153, 1842.- Bleeker, *Verh. Bat. Gen.*, 25, p.60, 1853.
- Barbus duvacelli* Valenciennes, *Hist. Nat. Poiss.*, 16, p.167, 1842 (type locality, Bengal).
- Barbus immaculatus*, Gunther, *Cat. Fish. Brit. Mus.*, 7, 113, 1861.
- Barbus polydori* Valenciennes, *Hist. Nat. Poiss.*, 16, p.170, 1842 (type locality, Bombay).- Bleeker, *Verh. Bat. Gen.*, 25, p.60, 1853.
- Barbus pinnauratus* Day (in part), *Fish. India*, p.561, pl.139, fig.3, 1878.- Day, *Fauna Brit. India, Fish*, 1, p.301, 1889.- Hora & Misra, *J. Bombay nat. Soc.*, 39(3), pp.511, 512, 515 (Asunda, Darna rivers, Deolali).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 40(1), p.22, 1938 (Deolali).- Hora, *Rec. Indian Mus.*, 40(3), p.239, 1938 (Timinar at foot of Bailadila hills, M.P.).- Hora & Nair, *Rec. Indian Mus.*, 44(2), p.195, 1942 (Hoshangabad dist., M.P.).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 43(2), p.225, 1942 (Poona).
- Barbus chrysopoma*, Hora & Misra, *J. Bombay nat. Hist. Soc.*, 39(3), p.510, 1937 (Aounda river, Deolali, Maharashtra).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 40(1), p.22, 1938 (Deolali, Poona).
- Barbus (Puntius) chrysopoma*, Hora & Nair, *Rec. Indian Mus.*, 43(3), pp.371, 372, 1941 (Harda, Hoshangabad dist., M.P.).
- Puntius sarana orphoides*, Tilak, *Rec. zool. Surv. India*, 67(1-4), p.96, 1973 (Goa, Valus river).
- Barbus (Puntius) sarana*, Hora, *Rec. Indian Mus.*, 42(2), p.366 (Sihawa), p.369 (Dhamtari Bazar, Mahanadi, M.P.), 1940.- Hora & Law, *Rec. Indian Mus.*, 43(2), p.237, 1941 (name only, distribution).- Hora & Gupta, *J. Asiat. Soc. Beng.*, 6(2), p.79 1941 (Kalimpong Duars, N. Bengal).- Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (name only, synonyms indicated).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 43(2), p.224, 1942 (Poona; *chrysopoma*, *pinnauratus* synonymy justified).- Hora & Mathur, *Bull. Natnl. Inst. Sci. India*, No.1, p.32, 1952 (Rajasthan, name only).- Haque, *Biologia*, 1(1), p.91, 1955 (scale structure).- Job, David & Das, *Indian J. Fish.*, 2(1), p.32, 1955 (Mahanadi below Hirakud Dam).- Moona, *Rec. Indian Mus.*, 58(2), p.63, 65, 1962 (Bharatpur, dist. Rajasthan).- Bhuiyan, *Asiat. Soc. Pakistan*, No.13, p.33, fig.1964 (Dacca).- Murty, *Proc. Indian Acad. Sci.*, 85 (B) (3), p.122, 1977 (Kolleru Lake).
- Puntius sarana*, Smith, *Bull. US. Nat. Mus.*, 188, p.187, 1945 (Thailand).- Hora, *J. zool. Soc. India*, 1(1), p.2, 1949 (Rihand river, U.P.).- Chauhan & Ramakrishna, *Rec. Indian Mus.*, 51, p.404, 1953 (Tel river, Balangir dist., Orissa).- Motwani & David, *J. zool. Soc. India*, 9(1), p.11, 1957 (Sone river, Bihar).- Misra, *Rec. Indian Mus.*, 57(1-4), p.155, 1962 (brief description).- Karamchandani, *Tropical Ecology*, 3(1 & 2), p.80, 1962 (R. Ganga

at Dighwara, Bihar).- Menon, *Spolia Zeylanica*, 30(1), p.68, 1963 (sub species recognised on the basis of lateral line scale counts; all populations of India north of Krishna river, Pakistan, Bangladesh, Nepal, Sikkim, Bhutan referred).- Datta & Majumdar, *Rec. zool. Surv. India*, 62(1 & 2), p.88, 1961 (Rajasthan).- Mirza, *Biologia*, 16(2), p.82, 1970 (R. Ravi, Lahore). Sen *et al.*, *Seafood Export J.*, 11(1), p.3, 1970 (local names of Calcutta fish).- Islam & Siddiqui, *Biologia*, 17(1), p.38, 1971 (R. Jhelum, Punjab, Pakistan).- Menon *et al.*, *Sci. & Cult.*, 38, p.341, 1972 (Hooghly river, Pulta stretch).- Mirza, *Biologia*, 18(2), p.167, 1972 (rare in Baluchistan, record of Day from river Nulli-ni near Kota Meer Mohammad quoted).- Mirza, *Biologia*, 20(1), p.78, 1974 (name only, south and south east Baluchistan, Indus Plain and adjoining hills).- Mirza & Omer, *Pakistan J. Zool.*, 6(1 & 2), p.193, 1974 (River Haaro, Hasan Abdal, Punjab, Pakistan).- Rahman, *Bangladesh J. Sci. & Indus Res.*, 9(3 & 4), p.202, (name only, Bangladesh, Bengali name), p.153, (Key for identification), 1974.- Rahman, *Bull. FW. Fish. Res. Stn. Chandpur*, No.1, 1974 (name only, Checklist, Bangladesh).- Bashir & Mirza, *Bull. hydrobiol. Res. Gordon coll.*, (1), 9, p.94, 1975 (River Sutlej, Chandpl) Mirza, *Bijdr. Dierk.*, 45(2), p.169, 172, 1975 (Aba Singh division, Indus plain, adjoining hills, S. Baluchistan).- Jayaram *et al.*, *Bull. Govt. Madras fish. dept.*, 7, p. 1976 (Cardamom gills, variations).- Mirza, *Biologia*, 22(1), p.115, 1976 (name only, montane and submontane regions of Pakistan).- Srivastava & Venkateswarlu, *Indian J. Zootomy*, 17(3), p.181, 1976 (name only, local name, plains of U.P.).- Singh, *Rec. zool. Surv. India*, 71, p.124, 1976 (Nirmali, Jharai river, Bihar).- Jayaram & Majumdar, *Rec. Zool. Surv. India*, 69 p.313, 1976 (R. Mahanadi Orissa & M.P.).- Pillai & Yazdani, *Rec. zool Surv. India*, 72, p.5, 1977 (Garro Hills).- Venkateswarlu, *Acta. Ichthyol. Piscatoria*, 7(1), p.49, 1977 (River Poonpun, Bihar).- Jayaram & Singh, *Rec. Zool. Surv. India*, 72, p.253, 1977 (River Purnaloava N. Bengal).- Mirza, *Proc. Ist. Pakistan Congr. Zool.*, p115, 1980 (checklist, distribution in Pakistan & Azad Kashmir).- Srivastava, *Fishes of UP & Bihar*, p.67, fig.47, 1980 (key, description).- Butt & Mirza, *Biologia*, 27(2), p.155, 1981 (Peshawar Valley, NWFP, Pakistan).- Mirza, *Fish. Lahore*, p.12, fig.1982 (Lahore, brief diagnosis).- Mirza & Abdussamad, *Biologia*, 28(1), p.62, 1982 (description, Pakistan).- Mirza & Omer, *Biologia*, 30(1), p.81, 1984 (key, rare in Baluchistan, Day's record from Nulli-ni near Kota Meer Mohammad quoted).

Puntius sarana sarana, Venkateswarlu, *Indian J. Zootomy*, 13(3), p.122, 1972 (name only, Bihar).- Venkateswarlu & Rama Rao, *Seafood Export J.*, 5(6), p.3, 1973 (vernacular names in Gangetic delta).- Menon, *Spl. Publ. No.1, Ind. Fish. Soc. India*, p.41, 1974 (checklist of Himalayan & Indo-Gangetic fishes).- Venkateswarlu, *Acta Ichthyol. Piscatoria*, 6(2), p.92, 1976 (R. Gandak, near Patna).- Sen, *Seafood Export J.*, 10(1), p.3, 1978 (Assam, local & English names).- Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*, 9(1), p.52, 1979 (name only, list of Ganga fishes).- Jayaram, *Handbk. FW. Fish. India*, p.102 (distribution), p.104 (Key), 1981.- Husain & Tilak, *Rec. zool. Surv. India*, 81, p.274, 1984 (name only, Faizabad dist., U.P.).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.38, 1984 (common & vernacular names).- Sen, *Occ. Paper zool. Surv. India*, No.64, p.79, 1985 (Assam).- Lipton, *Matsya*, 9 & 10, p.111, 1985 (Tripura).

Barbus sarana, Valenciennes, *Hist. Nat. Poiss.*, 16, p.151, 1842.- Bleeker, *Verh. Bat. Gen.*, 25, p.60, 1853.- Gunther, *Cat. Fish. Brit. Mus.*, 7, p.115, 1861.- Day (in part), *Fauna Brit. India, Fish.*, 1, p.300, 1889.- Day (in part), *Fish. India*, p.560, pl.136, fig.2, 1878.- Jenkins, *Rec. Indian Mus.*, 5, p.140, 1910 (name only, Monghyr, Bihar).- Chaudhuri, *Rec. Indian Mus.*, 8, p.244, 1913 (Abor hills).- D' Abreau, *Rec. Nagpur Mus.*, 9, p.20, 1936.- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 39(3), p.512 (Lake Beale, Deolali), 513, 515, 517, 518, 519 (Darna river, Deolali), 1937.- Shaw & Shebbeare, *J. Asiat. Soc. Beng.*, 3, p.41, pl.5, fig.2, text fig.36, 1937 (N. Bengal).- Hora & Misra, *J. Bombay nat. Hist. Soc.*, 40(1), p.22, 1938 (name only).- Hora & Nair, *Rec. Indian Mus.*, 43, (3), p.371, 372, 1941 (name only, relationships with *pinnauratus*, *chrysopoma* indicated).- Pillay, *Proc. nat. Inst. Sci. India*, 17(5), p.340, 1951 (morphometric analysis of related species).- Sinha & Shiromany, *Rec. Indian Mus.*, p.62, 1953 (name only, Hindan Nadi, Meerut).- Hora & Pillay, *FAO Fish. Biol. Tech. Pap.*, (12), p.61, 1962 (key for identification of fry).- Dutt & Murty, *Mem. zool. Soc. Guntur.*, 1, p.7, 1975 (Kolleru lake, Andhra Pradesh).

Puntius saberi Datta & Karmakar, *Bull. zool. Surv. India*, 3, (3), p.179, 1981 (type locality, Cheroguru Talab, Pujaripal Village, Sokma, Bastar district, Madhya Pradesh.)

Vernacular Names : Sen-nee, Sani putthi, Maraputhi, Ass; Sarana, Saval puli, Swarna puti, Kurti, Beng; Sarana, Guj; Giddi kaoli, Durhie, Potah, Hindi; Gid-pakka, Parki, Kururai, Gende meenu Gid-pakke, Kan; Kuruka, Pullan. Mundutee, Kuruva Mal; Kudali Pitule, Khavli, Mar; Sarana Ori; Kharni, Bhangon, Kuhnee, Khangan, Puthia, Punj; Pingella, Panjelai kendai, Pallu kendai, Sani kendai, Botha kendai, Kilathi, Tam; Kakoo, Kadoon, Kunnamoo, Paraga, Godha paraga, Kanga pakki, Tel.

Specimens Studied : ZSI, F.1508, 1 ex., 143.5 mm SL, Girwa river, U.P. ZSI, F.4657/1, F.4658/1, 2 exs., 62.5 and 69.0 mm SL, Jamnani Nadi, Saran, Bihar, M. Mackenzie coll. F.13430, 1 ex., 84.00 mm SL Kalimpong Duars, Siliguri Teesta river, S.L. Hora coll. ZSI, F.7767/1, 1 ex., 137 mm SL, Dibrugarh, Assam, FF. 1398, 2 exs., (type of *P. saberi* Dutta & Karmakar, 30 & 32 mm SL, Cheroguru Talab, 50 kms., Bastar, Madhya Pradesh.

TABLE 12
Comparison of the species of the "*sarana*" group
1. The *sarana* complex

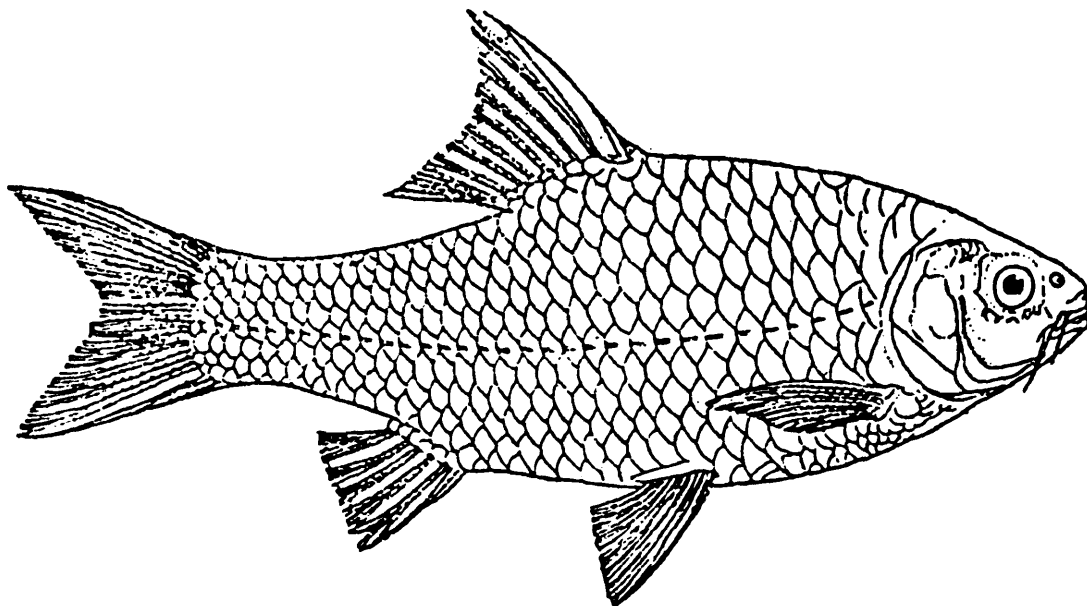
Characters	<i>P. sarana sarana</i> (Ham.) 1822, pp.307, 388	<i>P. jayarami</i> , V. & T. Singh 1986, p.129
1. Number of barbels	Four	Four
2. Last unbranched dorsal ray	Osseous, strong serrated	Osseous, strong serrated
3. Lateral line	Complete	Complete
4. Lateral line scales	30 to 34	28 to 32
5. PDS	10 or 11	10
6. LL/Dorsal	5 ¹ / ₂ to 6	4 ¹ / ₂
7. LL/Pelvic	3 ¹ / ₂ to 4 ¹ / ₂	2 ¹ / ₂ to 3 ¹ / ₂
8. LL/Anal	4 ¹ / ₂	2 ¹ / ₂
9. Circumpeduncular	7 or 8	9 to 12
10. Pre-anal	16	15 to 18
11. Pre-pelvic	6	7 to 9
12. Gill-Rakers	2 or 3 + 3 to 8	2 + 16
13. SL/LH	2.30 to 3.71	4.60
14. SL/Body depth	1.60 to 3.00	3.31
15. LH/Eye	3.27 to 4.75	3.69 to 4.71
16. LH/Snout	2.85 to 3.80	2.80 to 3.17
17. IOW/Eye	1.38 to 1.83	1.38 to 1.78
18. Snout/Eye	1.00 to 1.33	1.23 to 1.67
19. LCPD/HCPD	1.22 to 2.00	1.15 to 1.44
20. Width of Mouth/IND	greater than IND	greater than or equal to IND
21. Dorsal fin base	equal to or greater than HCPD	greater than HCPD
22. Colour	A finger like spot	No spot on tail
23. Distribution	Wide	Manipur

Diagnosis : A moderately deep bodied fish, with four barbels, dorsal ray osseous, serrated, lateral line complete with 30 to 33 scales and a prominent finger like dark spot over caudal peduncle. Each scale with a which all give an appearance of a black longitudinal lines over body dark border posteriorly.

Description : D. II-III, 8; P. 15-16; V. i, 8; A. ii-iii, 5; C. 19; LL. 30-34 (31 or 32 mostly).

Dorsal and ventral profiles slightly arched. Head moderate and bluntly pointed. Head length 26.95 to 43.48; body depth 33.33 to 62.50 in standard length. Head width 56.52 to 76.34; height of head at occiput 78.26 to 95.24; snout 26.31 to 35.09 in percent of head length. Snout bluntly pointed, without any pores. Eyes moderate, superior 21.05 to 30.58 in percent of head length, 54.64 to 72.52 in percent of interorbital width and 75.19 to 100.00 of snout length. Mouth antero-superior, its width greater than internostril distance. Lips thin, Two pairs of barbels.

Dorsal fin inserted nearer caudal base than tip of snout. Last unbranched dorsal ray osseous, strong, serrated posteriorly with 12 to 14 teeth. Dorsal fin base equal to or greater than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 50.00 to 81.82 in percent of its length. Lateral line complete.



Lateral view of *P. sarana sarana*

Scales : PDS 10 or 11; Pre-anal 16; Pre-Pelvic 6

Between LL and dorsal fin base	$5\frac{1}{2}$ - 6
Between LL and pelvic fin base	$3\frac{1}{2}$ - $4\frac{1}{2}$
Between LL and anal fin base	$4\frac{1}{2}$
Circumpeduncular	7 or 8

Gill Rakers : 2 or 3 + 3 to 8

Size : 600 mm TL

Colour : Dark brown above and sides, light brown below; fins yellowish white. A prominent finger-like black spot present on caudal peduncle. When fresh silvery, opercles shot with gold and with horizontal bands along rows of scales in upper half of body.

Distribution : Throughout India, north of Krishna river system, Pakistan, Nepal, Bangladesh, Burma. The Sri Lankan population have been separated as a subspecies *P. sarana spilurus* by Menon (1963).

Relationships : An unique species of apparently independent stock whose affinities lie with some other Cyprinine genus. It is similar to *P. filamentosus* in colouration, but differs markedly from it.

Remarks : Found in ponds and rivers, this fish is predominantly a plant feeder. Breeds during monsoon months in shallow waters prolifically.

Pillay (1951) on the basis of morphometric studies demonstrated that *Barbus chrysopoma*, *B. caudimarginatus*, *B. oaetesi*, *B. myitkyinae* and *B. sewelli* are synonymous with *P. sarana*. *B. binduchitra* was shown as a subspecies and *B. pinnauratus* as a race. Menon (1963) made a statistical analysis of *sarana* on the basis of lateral line scale counts only and divided it into four subspecies as below:-

P. sarana sarana (Hamilton)

Lateral line scales 30-34. All populations north of the Krishna river system in South India, Pakistan, Nepal, Bangladesh.

P. sarana subnasutus (Val.)

Lateral line scales 28 to 31. All populations in Krishna river and south of it in Peninsular India.

P. sarana orphoides (Val.)

Lateral line scales 28 to 34. All populations in Manipur, Burma, Thailand, Malaya, Java and Borneo.

P. sarana spilurus (Gunther)

Lateral line scales 26 to 28. All populations in Sri Lanka.

B. binduchitra was placed under the synonymy of *P. sarana orphoides*. *B. pinnauratus* Day was shown as composite and merged in parts under *P. sarana subnasutus*, *P. sarana orphoides* and the nominal species.

Murty (1977) while studying the Cyprinid fishes of Kolleru lake, considered the above subspecies of *sarana* as invalid since according to him data of specimens from type localities have not been compared with samples of the four subspecies from different localities.

Such a study suggested by Murty itself will become a separate subject matter; pending such an investigation, since the subspecies are of different geographical areas and zones, for sake of convenience the four subspecies are retained. In the light of above, the various misidentifications have been properly placed under the synonymy of respective subspecies.

Mirza & Abdussamad (1982) are of the opinion that *P. sarana* belongs to a different stock since among the species of *Puntius*, this alone has rectangular scales and 36 vertebrae as compared to dome shaped scales and 30 or less than 30 vertebrae in other species. This also is another separate problem for investigation.

Puntius saberi Datta & Karmakar is synonymised with this species. *P. sarana sarana* is a widely distributed species showing variations. The new species proposed by Datta & Karmakar (1981) for 13 examples 28–45 mm in total length from Bastar do not stand out distinctly from *P. sarana sarana* to warrant even a new subspecific status, not to speak of a species level. The authors differentiated *saberi* from *sarana* by its longer anal fin 5.8 to 7.0 to 10.0, longer dorsal fin 3.7 to 4.7 vs. 4.1 to 6.4 in relation to total length besides a bigger head (2.7 to 3.3 vs. 3.2 to 5.3). The species was described on comparatively younger examples. When these data are compared with the available one both from the vast literature (see synonymy) as well as material, they do not justify the proposal of a new species. I have examined the holotype of *P. saberi*, ZSI FF.1398 32 mm SL and one para type 30mm SL of same registration. Both specimens are very badly preserved and I have no doubt that the species is invalid as it is based on juveniles.

Additional Data : N = 4

TL Head length

TL/Body depth

SL/Pre dorsal 51.57 to 57.97

SL/Pre anal 73.17 to 75.36

SL/Pre pelvic 48.78 to 65.22

LH/LCPD 61.11 to 73.68

LH/HCPD 50.00 to 57.89

LH/Width of Mouth 23.68 to 34.26

LH/Dorsal fin base 52.17 to 60.53

TABLE 13
Comparison of *P. sarana* and its subspecies

Characters	<i>P. sarana sarana</i>	<i>P. sarana orphoides</i>	<i>P. sarana spilurus</i>	<i>P. sarana subnasutus</i>
LL Scales	30 to 34	28 to 34	26 to 28	28 to 31
PDS	10 or 11	10 to 13	8 to 10	8 to 10
Pre-pelvic	6	7	7 or 8	7 or 8
Circumpeduncular	7 or 8	14 to 16	10 or 11	7 or 8
DISTRIBUTION	India north of Krishna river system, Pakistan, Nepal, Bangladesh	Manipur, Burma, Thailand, Malaya, Java and Borneo	Sri Lanka	India Krishna river system and south of it.

Puntius sarana spilurus (Gunther)

Puntius (Barbodes) chrysopoma, Bleeker, *Nat Verh. Holl. Maatch. Wetensch.*, (2) 20, p.15, pl.3, fig.1, 1864.

Barbus spilurus, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.114, 1868.

Puntius sarana, Deraniyagala, *A coloured Atlas of some vertebrates from Ceylon*, 1, p.29, 1952.- Munroe, *The Marine and freshwater fishes of ceylon*, p.45, pl.8, fig.122, 1955.

Puntius chrysopoma, Deraniyagala, *Spolia Zeylanica*, 16(1), p.18, 1930 (description, distribution in Sri Lanka; opines that young of *chrysopoma* have been described by Day as *B. innominatus*).- Herre, *Spolia Zeylanica*, 24(3), p.175, 1946 (Peradeniya, Tedulla, Sri Lanka).

Puntius sarana, Silas, *Bull. Nat. Inst. Sci. India*, No.7, p.251, 1952 (name only, Sri Lanka).- Silas, *Proc. nat. Inst. Sci. India*, 18(5), p.424, 1952 (name only, distribution).- Munroe, *The Marine & FW. fish. Ceylon*, p.45, (synonymy, brief diagnosis, distribution in Sri Lanka).

Puntius sarana spilurus, Menon, *Spolia Zeylanica*, 30(1), p.67, 1963 (Sri Lanka population of *sarana* referred).- Jayaram, *Handbk. FW. Fish. India*, p.102, (distribution) p.104 (key) 1981.

Puntius timbiri Deraniyagala, *Spolia Zeylanica*, 30(1), p.71, pl.1, figs. 2,3, 1963 (type locality, Valave river at Timbirigas - mankada, Sri Lanka).

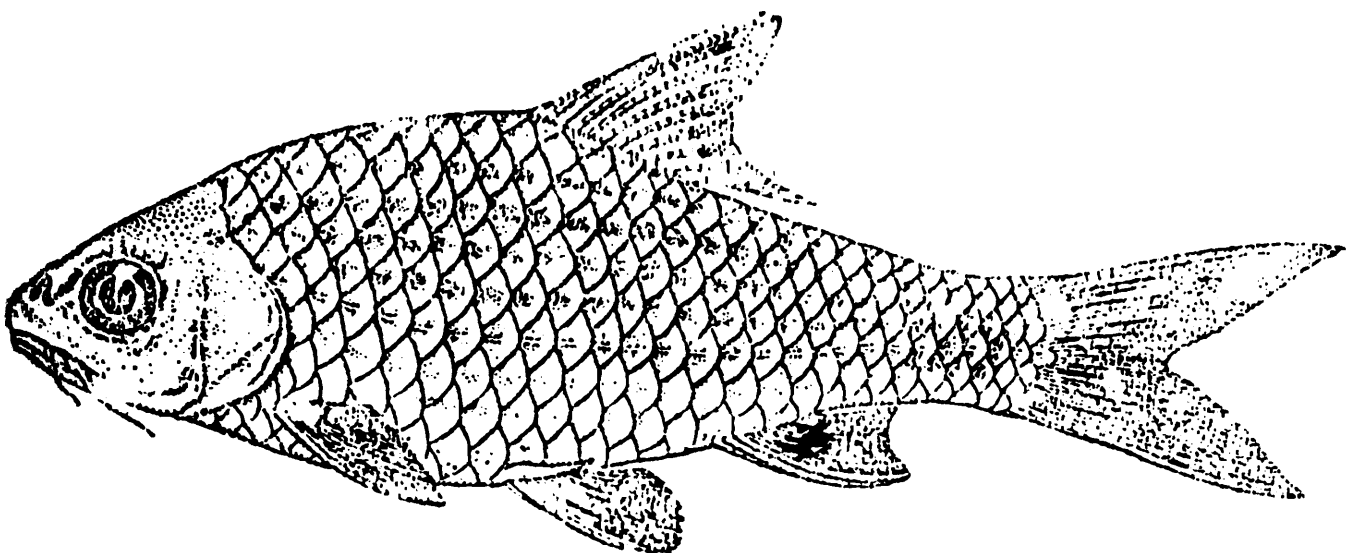
Vernacular Names : *Mas bethiya, Vellam kolla pethiya* Sinhalese.

Specimens Studied : ZSI, 2181/2, 1 ex., Paratype of *P. sarana ceylonensis* Menon, 28 mm SL., Sri Lanka. Data of 2 exs., 180.0, 182.0 mm in SL from Kirindi oya, Telulla, and Yala, Manik Ganga given by Deraniyagala, 1963.

Diagnosis : Differing from the nominal species in distribution and lateral line having 26 to 28 scales.

Description : D.I-II, 8; P.15-17; V.i, 8; A.ii, 5; C.17-19; LL.26-28.

Head length 25.82 to 28.41; body depth 35.71 to 39.21 in percent of standard length. Width of head 52.94 to 62.89; height of head at occiput 76.33 to 81.30; snout 29.41; eyes 25.00 in percent of head length.



Lateral view of *P. sarana spilurus*

Eyes 40.00 to 70.84 in percent of interorbital width, 75.00 to 85.00 of snout length. Least depth of caudal peduncle 59.52 to 68.00 in percent of its length.

<i>Scales</i> :	PDS 8 to 10; Pre-anal 14 or 15; Pre-pelvic 7 or 8
	Between LL and dorsal fin base $3\frac{1}{2}$ to $4\frac{1}{2}$
	Between LL and pelvic fin base $3\frac{1}{2}$
	Between LL and anal fin base $2\frac{1}{2}$ to $3\frac{1}{2}$
	Circumpeduncular 10 or 11

All other characters as in the nominal species.

Colour : Greenish-blue above, dull yellow below, 8 longitudinal rows of prominent black spots on the sides, each spot being situated at the free portion of the successive scales. A black band behind operculum from its upper angle to base of pectoral fin present. A finger like large black blotch is also present at the caudal fin base. Dorsal, pectoral and caudal fins are dusky, the ventrals and the anal yellowish-white.

Distribution : Sri Lanka only

Relationships : Differs from the nominal species in lateral line, circumpeduncular scale counts besides distribution (see table 13).

Remarks : *Puntius timbiri* Deraniyagala, 1963 is synonymised with this species. My good friend Dr. Rohan Pithiyagoda who is writing a book on Sri Lankan fishes and who has a rich experience of collecting and studying the Island's fishes, informs me that *P. timbiri* is a badly preserved specimen of *P. sarana* and that the species is non-existent in Sri Lanka. I agree with his views as the comparison of the species fails to justify its independent status.

Additional Data :

TL/Head length	20.24
TL/Body depth	29.77
SL/Pre dorsal	54.69
SL/Pre anal	71.48
SL/Pre pelvic	50.00
LH/LCPD	73.53
LH/HCPD	50.00
LH/Dorsal fin base	60.60
LH/Width of mouth	45.00

Puntius sarana subnasutus (Valenciennes)

Barbus subnasutus Valenciennes, *Hist. Nat. Poiss.*, 16, p.154, 1842 (type locality, Pondicherry).- Bleeker, *Verh. Bat. Gen.*, 25, p.60, 1853.

Barbus gibbosus Valenciennes, *Hist. Nat. Poiss.*, 16, p.155, 1842 (type locality, Alleppey).- Bleeker, *Verh. Bat. Gen.*, p.60, 1853.

Barbus chrysopoma Valenciennes (in part). *Hist. Nat. Poiss.*, 16, p.165, pl.466, 1842 (type locality, Malabar).- Bleeker, *Verh. Bat. Gen.*, 25, p.60, 1853.- Gunther (in part), *Cat. Fish. Brit. Mus.*, 7, p.113, 1868.- Day (in part), *Fish. India*, p.561, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.301, 1889.- Jenkins, *Rec. Indian Mus.*, 3, p.288, 1909.- Hora, *Rec. Indian Mus.*, 39, p.19, 1937 (Cauvery river, Coorg).

- Puntius chrysopoma*, Day, *Fish. Malabar*, p.208, 1865.
- Barbus russellii*, Gunther (in part), *Cat. Fish. Brit. Mus.*, 7, p.121, 1868.
- Cyclohelichthys pinnauratus* Day, *Proc. zool. Soc. Lond.*, p.300, 1865.
- Puntius pinnauratus* Day (in part), *Fish. Malabar*, p.209, pl.15, fig.2, 1865.- Gunther, *Cat. Fish. Brit. Mus.*, 7, p.114, 1868.
- Barbus pinnauratus* Day (in part), *Fish. India*, p.561, pl.139, fig.3, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.301, 1889.- Venkateswarlu & Rama Rao, *Occ. Paper zool. Surv. India*, No.87, p.12, 1986 (synonym of *P. sarana*).- Hora, *Rec. Indian Mus.*, 39, p.9, fig.1 (Thunga river, Shimoga) p.19 (Cauvery, Coorg.) 1937.- Hora & Law, *Rec. Indian Mus.*, 43(2), p.247, 1941 (Travancore).
- Barbus sarana pinnauratus*, Pillay (in part), *Proc. Nat. Inst. Sci. India*, 17(5), p.340, 1951.
- Puntius sarana*, Rajan, *J. Bombay nat. Hist. Soc.*, 53(1), p.45, 1955 (name only, Bhavani & Moyar rivers, Nilgiri hills).- Menon, *Rec. Indian Mus.*, 59(4), p.379, 1966 (Cuddalore, Karaikkal, Veeranam Lake).
- Barbus (Puntius) pinnauratus*, Hora & Law, *Rec. Indian Mus.*, 43, (2), p.247, 1941 (Kulathupuzha, Chittar stream, Kerala).-
- Puntius sarana pinnauratus*, Menon, *Rec. Indian Mus.*, 59(4), p.379, 1966 (Usteri tank, Veeranam Lake).
- Puntius sarana subnasutus*, Menon, *Spolia Zeylanica*, 30(1) p.69, 1963 (all populations South of Krishna river referred).- Tilak, *Rec. zool. Surv. India*, 67(1-4), p.69 1973 (Goa, Arvalem waterfalls).- Jayaram, *Handbk. FW. Fish. India*, p.102 (distribution), p.104 (key), 1981.- Jayaram, *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.62, 1982 (key, Cauvery, river, S. India; status of *P. pinnauratus* discussed).
- Puntius sarana sarana*, Jayaram *et al.*, *Occ. Paper zool. Surv. India*, No.36, fig.12, p.63, 1982 (key, Cauvery river, S. India)
- Barbus sarana*, Hora, *Rec. Indian Mus.*, 38, p.1, 1936 (name only, Chitaldrug dist., Karnataka).- Misra, *Rec. Indian Mus.*, 40, p.260, 1938 (Kodur, Nallamalai hills, E. ghats).
- Hora & Law, *Rec. Indian Mus.*, 43(2), p.237, 1941 (Travancore, Kerala).- Chacko, Krishnamurthi & George, *Contrib. FW. Fisheries Biol. Stn., Madras*, No.3, p.3, 1952 (Kanigiri, Duvvur reservoir, Andhra Pradesh).- David, *Proc. nat. inst. Sci. India*, 22(B) (3), p.153, 1956 (Bhadra river at Bhadravati).

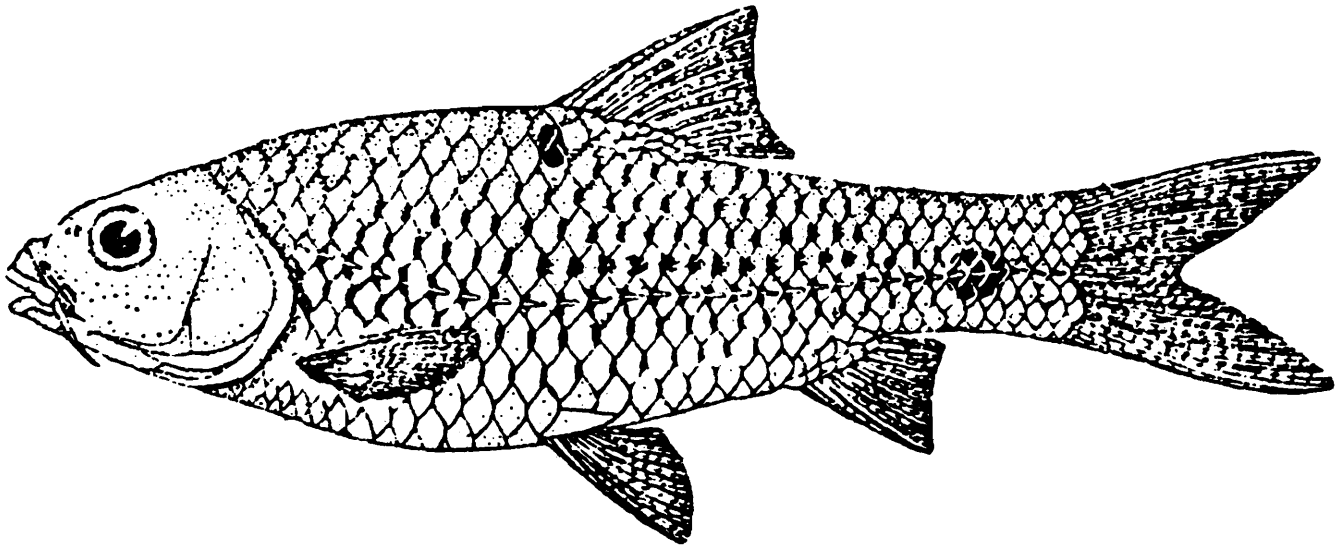
Vernacular Names : Mostly as for nominal form.

Specimens Studied : ZSI, SRS, Unregd. 250 exs., 58.0 to 145.0 mm SL, from different localities of Cauvery river System, KCJ coll., 1973, 1974, 1977. ZSI, SRS, Unregd. 2 exs., 71.0 & 161.0 mm SL, River Krishna at Krishna Agraharam, Gadwal, Andhra Pradesh, 17.12.87. KCJ coll. ZSI, SRS, 1 ex., River Krishna at Digraj, Sangli district, Maharashtra State, 29.12.87. ZSI, SRS, Unregd., 1 ex., 142.5 mm SL, Buggavagu reservoir, Nizamsagar, Nalgonda district, Andhra Pradesh, 6.12.87. ZSI, SRS, Unregd., 2 exs., 152.0 & 154.0 mm SL., Kurnool fish market, purchased, Andhra Pradesh, 14.12.87., KCJ coll. ZSI, SRS, Unregd., 1 ex., 152.0 mm SL, Muddebihal fish market, Bijapur district, Karnataka, 24.12.87, KCJ coll. ZSI, SRS, Unregd., 1 ex., 152.0 mm SL, Muddebihal fish market, Bijapur district, Karnataka, 24.12.87, KCJ coll. ZSI, SRS, Unregd., 1 ex., Dhom reservoir on River Krishna and Vatali at Asari Village, Wai, Satara district, Maharashtra State, 3.1.88, KCJ coll. ZSI, SRS, Unregd., 2 exs., 60.5 & 127.0 mm SL., River Krishna at Huvinahadagi, Karnataka State, 22.12.87, KCJ coll. ZSI, SRS, Unregd., 1 ex., 83.5 mm SL, River Krishna at Siruguppe, 18 km from Jamkhandi, Bijapur district, Karnataka State, 20.12.87, KCJ. coll.

Diagnosis : Differing from the nominal species in distribution and having lateral line scales 28 to 31.

Description : D. I, 8; P. 14-16; V. i, 8; A. i-ii, 5; C. 17-19; LL. 28-31.

Head length 24.15 to 29.41, body depth 25.77 to 39.68 in percent of standard length. Head width 40.65 to 65.78, height of head at occiput 53.19 to 98.03, snout 21.27 to 31.74, eyes 19.56 to 31.74 in percent of head length. Eye 40.00 to 81.30 in percent of inter orbital width, 56.49 to 68.02 of snout length. Least depth of caudal peduncle 56.17 to 81.96 in percent of its length.



Lateral view of *P. sarana subnasutus*

<i>Scales</i> :	PDS 8 to 10; Pre-anal 16-18; Pre-pelvic 7 or 8
	Between LL and dorsal fin base $5\frac{1}{2}$ to $6\frac{1}{2}$
	Between LL and pelvic fin base $3\frac{1}{2}$
	Between LL and anal fin base $4\frac{1}{2}$
	Circumpeduncular 7 or 8

Distribution : INDIA: Krishna River System, and south of it in peninsular India.

All other characters as in the nominal species.

Additional Data :

TL/Head length	19.56 to 22.83	N = 15
TL/Body depth	20.32 to 29.94	N = 15
SL/Pre dorsal	49.01 to 55.24	N = 20
SL/Pre anal	68.02 to 80.64	N = 20
SL/Pre pelvic	44.84 to 52.63	N = 20
LH/LCPD	58.82 to 85.47	N = 19
LH/HCPD	46.51 to 57.47	N = 20
LH/Dorsal fin base	48.54 to 63.29	N = 20
LH/Width of mouth	21.23 to 36.63	N = 20

Relationships : Differs from the nominal species in lateral line scale count and distribution.

***Puntius sarana orphoides* (Valenciennes)**

Barbus orphoides Valenciennes, *Hist. Nat. Poiss.*, 16, p.193, 1842 (type locality, Java).

Puntius orphoides Weber & Beaufort, *Fish. Indo-Austral. Archipel.*, 3, p.193, 1916.- Smith, *Bull. US. Nat. Mus.*, 188, p.190, pl.5, 1945 (Meping,, N. Thailand).

Barbus rubripinnis Valenciennes, *Hist. Nat. Poiss.*, 16, p.194, 1842.- Bleeker, *Nat. Tijdschr. Ned. Indie*, 9, p.406, 1855.- Gunther, *Cat. Fish. Brit. Mus.*, 7, p.116, 1868.

Barbus saranella Bleeker, *Verh. Bat. Gen.*, 23, p.16, 1850.

Barbus gardonoides Bleeker, *Verh. Bat. Gen.*, 25, pp.60, 126, 1853.

Barbus caudimarginatus Blyth, *J. Asiat. Soc. Beng.*, 29, p.157, 1860.

Systemus (Barbodes) rubripinna, Bleeker, *Ichth. Arch. Ind. Prodr.*, 2, Cyprini, p.337, 1860.

Puntius (Barbodes) rubripinna, Bleeker, *Atlas. Ichth.*, 3, p.100, pl.33, fig.3, 1863.

Barbodes rubripinnis, Jordan & Seale, *Proc. U.S. nat. Mus.*, 32, p.538, 1908.

Barbus sarana caudimarginatus Annandale, *Rec. Indian Mus.*, 14, p.46, pl.111, fig.3, 1918 (Inle Lake, Burma; synonymy discussed).- Hora, *Rec. Indian Mus.*, 22, p.183, 1921 (Manipur).- Prashad & Mukerji, *Rec. Indian Mus.*, 31, p.199, 1929.- Hora & Mukerji, *Rec. Indian Mus.*, 36, p.124, 126, 127, 1934 (affinities discussed; Hapong, Burma).- Mukerji, *J. Bombay nat. Hist. Soc.*, 37(1), p.68, 1934.

Barbus sewelli Prashad & Mukerji, *Rec. Indian Mus.*, 31, p.197, pl.9, figs.1, 1a, 1b, 1929 (type locality, Indawgyi Lake, Myitkyina dist., Burma).- Hora & Mukerji, *Rec. Indian Mus.*, 36, p.123, 124, 127, 1934 (affinities discussed).- Hora, *Rec. Indian Mus.*, 39(4), p.329, 1937 (distinguishing characters, differences from other allied species).- Hora, *Rec. Indian Mus.*, 39(4), p.336, 1937 (affinities to *sarana* complex indicated).- Hora & Nair, *Rec. Indian Mus.*, 43(3), p.372, 1941 (name only, close affinity with *caudimarginatus*, *pinnauratus*, *chrysopoma* indicated).- Menon & Yazdani, *Rec. zool. Surv. India*. 61(1 & 2), p.106, 1968 (Holotype in ZSI).

Barbus (Puntius) binduchitra Hora, *Rec. Indian Mus.*, 39, p.327, text fig.4, 1937 (juvenile; type locality: road side drains and small streams at Sandoway, Lower Burma).- Hora, *Rec. Indian Mus.*, 39, p.336, 1937 (Burma; species relationship with *sarana* complex indicated).

Puntius pinnauratus Day (in part), *Fish. Malabar*, p.209, pp.15, fig.2, 1865.- Menon, *Bull. Raffles Mus.*, 25, p.25, 1954 (Kaki Bukit, Perlis, Malaya).

Barbus sarana sewelli Prashad & Mukerji, *Rec. Indian Mus.*, 36, p.123, 1934 (Hopong, S. Shan states, Burma).

Barbus (Puntius) sewelli, Hora, *J. Bombay nat. Hist. Soc.*, 42, (3) p.479, 1941 (Dalu, Upper Chindwin, Burma).

Puntius sarana orphoides, Menon, *Spolia Zeylanica*, 36(1), p.69, 1963 (all populations of Manipur, Burma, Thailand, Malaya, Java & Bor neo referred).- Jayaram, *Handbk. FW. fish. India*. p.102 (distribution), p.104 (key), 1981.

Puntius sarana, Menon, *Rec. Indian Mus.*, 52(1), p.22, 1956 (Manipur).

Vernacular Names : NIL

Specimens Studied : ZSI F. 10910, Holotype of *B. sewelli* 90mm SL, Indawgyi Lake, Myitkyina dist., U. Burma. ZSI F.11025/1, 103mm SL same date, non-typical specimen of *B. sewelli*. ZSI F.9370/1 F.9879/1, 5 exs, 71.0 to 116 mm SL, Fort Steadman, Inle Lake, S. Shan States, N. Annandale coll. F.5455, 1 ex, 77 mm SL, Moulmein, Burma. F.5453/1, 1 ex, 95 mm SL, Mandalay, Burma, Maj. Hadon coll. F.5459/1, 1 ex, 79 mm SL Prome, F.Day coll. F.5466/1, 1 ex, 150 mm SL, Burma, F.Day coll.

Diagnosis : Differs from the nominal species in distribution and in the lateral line having 28 to 34 scales. In preserved examples a silvery patch is present on the opercle.

Description : D. IV, 8; P. i, 14-16; V.ii, 8; A_n i-ii, 5; C.19; LL.28-34.

Head length 23.53 to 31.25; body depth 31.65 to 42.42 in percent of standard length. Head width 45.45 to 60.00, height of head at occiput 76.00 to 94.59; snout 29.63 to 36.84 in percent of head length. Eyes large, 23.77 to 33.37 in percent of head length, 54.55 to 77.78 in percent of interorbital width and 75.00 to 100.00 of snout length. Least depth of caudal peduncle 64.71 to 96.15 in percent of its length.

Scales : PDS 10-13; Pre-anal 17; Pre-pelvic 7

Between LL and dorsal fin base	5 $\frac{1}{2}$
Between LL and pelvic fin base	3 $\frac{1}{2}$
Between LL and anal fin base	3 $\frac{1}{2}$
Circumpeduncular	14 to 16

All other characters as in the nominal species.

Distribution : INDIA: Manipur, Burma, Thailand, Malaya, Java, and Borneo.

Relationships : Differs from the nominal species in lateral line and circumpeduncular scale counts besides distribution.

Remarks : *Barbus myitkyinae* Prashad & Mukerji, 1929 from Indawgyi lake, Burma has long been considered as synonymous with this species. Walter Rainboth, (*in litt.*) has indicated that this species along with few others are referable to genus *Poropuntius* Smith, 1931 (type species *Poropuntius normani* Smith). As such this species is dealt with elsewhere.

Additional Data :

TL/Head length	25.00 to 40.00*	
TL/Body depth	28.57 to 33.34*	
SL/Pre dorsal	49.35 to 56.34	N = 11
SL/Pre anal	64.71 to 75.72	N = 11
SL/Pre pelvic	45.29 to 51.94	N = 11
LH/LCPD	64.51 to 86.49	N = 11
LH/HCPD	45.16 to 52.00	N = 11
LH/Dorsal fin base	49.50 to 62.00	N = 11
LH/Width of Mouth	25.80 to 32.50	N = 11

* Data from Weber & Beaufort (1916) on *P. orphoides*

Puntius jayarami Vishwanath Singh & Tony Singh

Puntius jayarami Vishwanath Singh & Tombi Singh, *Rec. zool. Surv. India*, 83(1 & 2), p.129, fig.1, 1986 (type locality, Chakpi stream, Chakpit Karong, South Imphal).

Vernacular Names : *Heikak-nga* or *Naphet-nga*, Manipuri

Specimens Studied : ZSI, unreg. 2 exs., and 80.0 mm TL, Chakpi stream at Sherov, Imphal, Vishwanath Singh coll. 16.9.81.

ZSI, SRS unreg. 1 ex., 106 mm SL, Lokchao river, Moreh, Manipur, Vishwanath Singh coll. June 1986.

Diagnosis : A moderately deep bodied fish with four barbels, dorsal ray osseous, strong, serrated and lateral line complete with 28 to 32 scales.

Description : D. III, 8; P. 15; V 9; A. ii, 6; C. 21; LL. 28-32.

Dorsal profile slightly convex, ventral profile arched. Head short, conical. Head length 21.69, body depth 30.19 in percent of standard length. Head width 54.17 to 81.97, height of head at occiput 77.08 to 82.64, snout 31.54 to 35.71 in percent of head length. Snout plain, conical. Eyes large, lateral, visible from below ventral surface, 21.23 to 27.08 in percent of head length, 59.88 to 81.25 of snout length, 56.18 to 72.22 in percent of interorbital width. Mouth terminal, its width greater than or equal to inter-nostril distance. Lips thin. Two pairs of barbels.

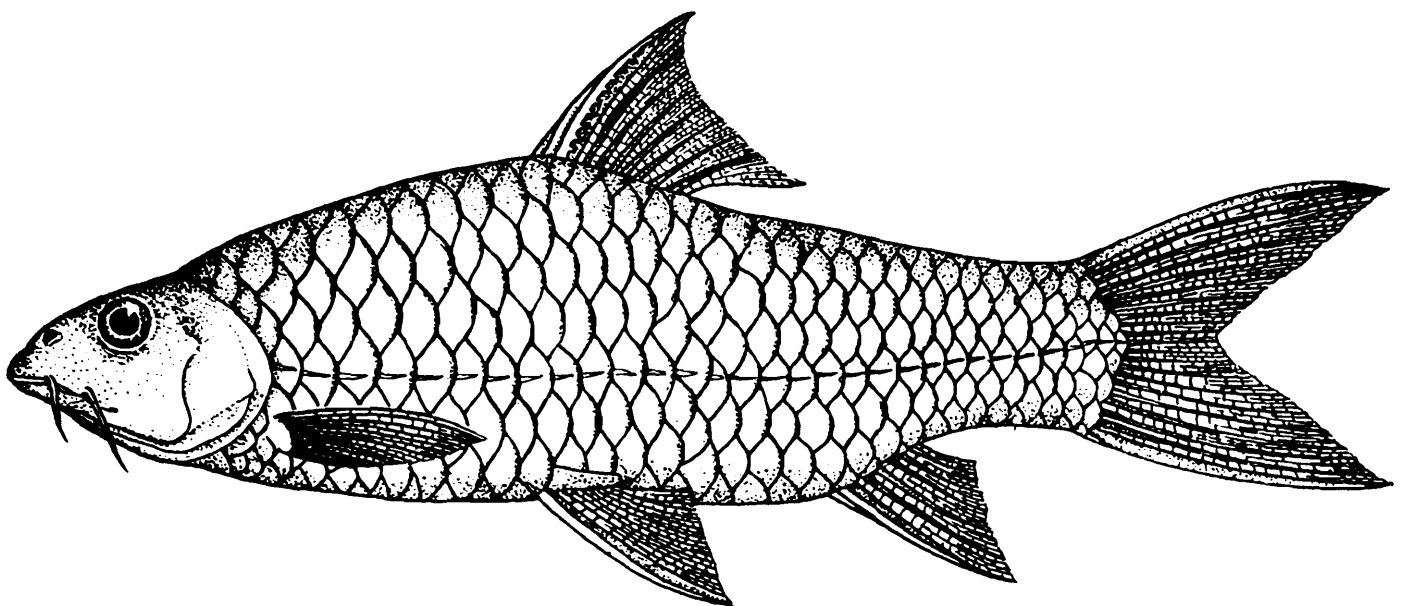
Dorsal fin inserted midway between tip of snout and caudal base, nearer tip of snout than caudal base. Last unbranched ray strong, finely serrated along upper half. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 69.44 to 86.96 in percent of its length. Lateral line complete.

Scales : PDS 10; Pre anal 15 to 18; Pre pelvic 7 to 9

Between LL and dorsal fin base	4 $\frac{1}{2}$
Between LL and pelvic fin base	2 $\frac{1}{2}$ to 3 $\frac{1}{2}$
Between LL and anal fin base	2 $\frac{1}{2}$
Circumpeduncular	9 to 12

Gill Rakers : 2 + 16

Size : 139.0 mm TL



Lateral view of *P. jayarami*

Colour : In formalin preserved specimens pale white with fins transparent. Fresh specimens are silvery, dark olivaceous dorsally, with fins tinged orange.

Distribution : INDIA: Manipur river, Imphal, Manipur.

Relationships : Related to *P. sarana orphoides* (Val.) differing from it in having shorter head, less body depth and squamation.

Remarks : The authors compared this species with a Bornean one. Its affinities are with the *sarana* complex.

Additional Data :

TL/Body depth	23.02	
TL/Head length	17.27	
SL/Pre dorsal	50.47	
SL/Pre anal	73.11	
SL/Pre pelvic	50.00	
LH/LCPD	45.45 to 75.00	N = 3
LH/HCPD	39.39 to 53.49	N = 3
LH/Width of Mouth	20.83	
LH/Dorsal fin base	66.67	

***Puntius binotatus* (Valenciennes)**

Barbus (Puntius) binotatus Valenciennes, *Hist. Nat. Poiss*, 16 p.168, 1842 (type locality, Java).- Hora, *Rec. Indian Mus.*, 30, p.37, 1928 (*B. goniosoma* Day synonymised).- Hora, *J. nat. Hist. Soc. Siam.*, 6, p.156, 1923 (Kohchang, Gulf of Siam, mountain streams).

Systomus (Barbodes) goniosoma Bleeker, *Acta. Soc. Sc. Indo-Neert.*, 8, p.52, 1860.

Puntius (Barbodes) goniosoma Bleeker, *Atlas Ichthyol.*, 3, p.105, pl.31, fig.1, 1863.

Barbus goniosoma. Gunther, *Cat. Fish. Brit. Mus.*, 7, p.124, 1868.- Day, *Fish. India*, p.562, pl.137, fig.2, 1878.- Day, *Fauna Brit. India Fish.*, 1, p.302, 1889.

Puntius binotatus, Weber & Beaufort, *Fish. Indo-Austral. Archipel.*, 3, p.187, fig.74, 1916.- Smith, *Bull. U.S. Nat. Mus.*, No.188, p.183, 1945 (Thailand).

Puntius goniosoma, Jayaram, *Handbk. FW. Fish. India*. p.100 (distribution). p.104 (key) 1981.

Vernacular Names : NIL

Specimens Studied : ZSI, F.10829/1, 3 exs., 16.5 to 18.5 mm SL., Pond in Kanbanta, Tavoy dist., Burma. F.105281, 1ex, 63 mm SL., Kohchung, Gulf of Siam (Mountain stream), Dr., Malcolm Smith.

Diagnosis : A deep bodied fish without any band on body, dorsal profile deeply convex with a distinct arch from occiput to dorsal base, four barbels, dorsal ray strong, osseous, serrated and lateral line complete with 23-27 scales. Snout conical with a groove, often with tubercles.

Description : D. I-II, 7 or 8; P. i, 15-17; V. i, 8; A. ii-iii, 5; C. 17; LL. 23-27.

Dorsal profile steeply arched than ventral with a distinct hump from occiput to dorsal base. Head obtusely rounded.

Head length 26.35 to 32.35, body depth 34.19 to 38.54 in percent of standard length. Head width 48.48 to 62.86, height of head at occiput 71.43 to 86.12, snout 30.56 to 34.28 in percent of head length. Snout conical, with a groove and tuberculated. Eyes 27.02 to 32.79 in percent of head length, 71.43 to 90.00 in percent of interorbital width and 81.82 to 90.90 of snout length. Mouth terminal or nearly so. Width of gape of mouth greater than inter-nostril distance. Lips rather thin, plain. Two pairs of barbels.

Dorsal fin inserted nearer caudal fin base than to tip of snout, dorsal base covered with a sheath of scales. Last unbranched dorsal ray osseous, strong, serrated. Dorsal fin base equal to least depth of caudal peduncle. Pectoral fins extending to pelvic fins; latter reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 69.23 to 95.24 in percent of its length. Lateral line complete.

Scales : PDS 8 to 10; Pre-anal 11 to 14; Pre-pelvic 5 to 7

Between LL and dorsal fin base 4 to 4 $\frac{1}{2}$

Between LL and pelvic fin base 2 to 2 $\frac{1}{2}$

Between LL and anal fin base 2 $\frac{1}{2}$

Circumpeduncular 10 to 12

Gill Rakers : 5+12

Size : 150 mm TL

Colour : Variable. scales with longitudinal lines. In smaller specimens generally a larger or smaller blackish spot at the base of the anterior dorsal rays present with another less distinct one in the middle of the root of the caudal, preceded by a faint dark longitudinal band. This band develops out of a series of more or less confluent black spots. In still younger specimens this series is represented by four or three widely separate black spots, besides, a black spot at the base of the anal fin is often seen which disappears with growth. Larger specimens may have pearl organs or nuptial tubercles on the cheek, or on centre of each scale besides a violet spot.

Distribution : BURMA: Mergui. Thailand more prevalent in Sumatra, Java, Bali, Lombok, Borneo, Banka, Biliton, Singapore, Philippines.

Relationships : Distantly related to *P. sarana orphoides* differing in having less number of scales in lateral line, body contour and other features.

Remarks : Weber & Beaufort (1916) demonstrated the individual variations in regard to body form and colouration of this species and were of opinion that the fish is confined to Sumatra. Nias, Java, Bali, Lombok, Borneo, Banka, Biliton, Singapore, Malacca and Philippines. They did not recognise *B. goniosoma* Bleeker, and also of Day who described it from Mergui, Burma as possibly synonymous with this species. Hora (1928) after examining two of Day's original examples from Kambanta, Tavoy district, Burma found that Day's *goniosma* is synonymous with *binotatus* which of course has priority.

Additional Data :

TL/Head length	26.28	N = 1
TL/Body depth	29.19	N = 1
SL/Pre dorsal	54.76 to 59.16	N = 4
SL/Pre anal	69.16 to 74.14	N = 4
SL/Pre pelvic	49.21 to 52.59	N = 4
LH/LCPD	56.75 to 74.28	N = 4
LH/HCPD	50.00 to 57.14	N = 4
LH/Dorsal fin base	48.48 to 65.71	N = 4
LH/Mouth width	19.45 to 24.32	N = 4

***Puntius roseipinnis* (Valenciennes)**

Barbus roseipinnis Valenciennes, *Hist. Nat. Poiss.*, 16, p.169, 1842 (type locality, Pondicherry).- Bleeker, *Verh. Bat. Gen.*, 25, p.60, 1853.- Jerdon, *Madras J. Lit & Sci.*, 15, p.314, 1849.- Day, *Fish. India*, p.562, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.303, 1889.

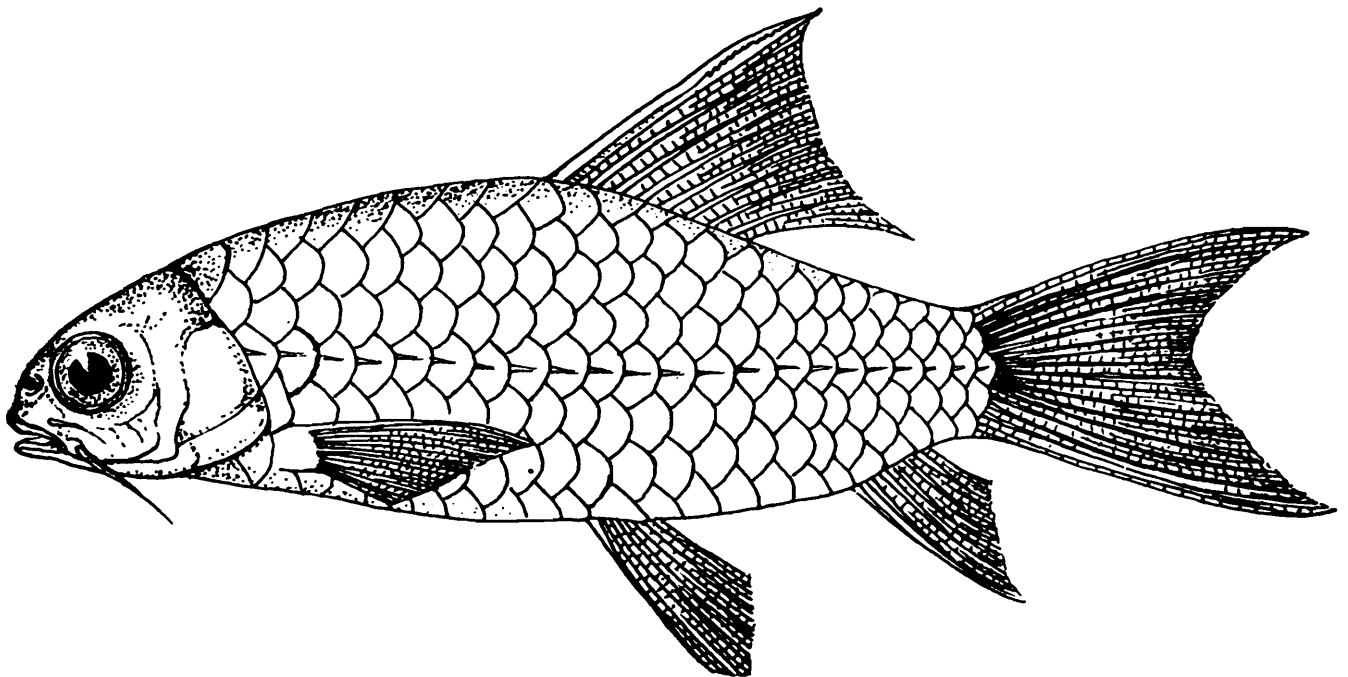
Puntius roseipinnis, Jayaram, *Handbk. FW. Fish. India*, p.102 (distribution), p.104 (key), 1981.

Vernacular Names : NIL

Specimens Studied : MHNP, 2 exs., syntypes, 83 & 93.5mm SL Pondicherry, M Belanger coll.

Diagnosis : A moderately elongated fish with anterior part high, four barbels, dorsal ray osseous, strong, serrated, lateral line complete with 22 scales. Pelvic, anal and caudal fins red with lower lobe of last tinged black.

Description : D. II-III, 8; P. 13-14; V i, 8; A. i-ii, 5; C. 18-20; LL. 22.



Lateral view of *P. roseipinnis*

TABLE - 14
Comparison of the species of the "binotatus" complex

Characters	<i>P. binotatus</i> (Val.), 1842, p. 168	<i>P. roseipinnis</i> (Val.), 1842 p. 169	<i>P. pleurotaenia</i> Bleeker, 1863 p. 242	<i>P. compressiformis</i> (Cockerall), 1913 p. 133
1. Number of barbels	Four	Four	Four	Four
2. Last unbranched dorsal ray	Osseous, strong serrated	Osseous, strong serrated	Osseous, strong serrated	Osseous, strong serrated
3. Lateral line	Complete	Complete	Complete	Complete
4. Lateral line scales	23 to 27	22	26 to 30	35 to 37
5. PDS	8 to 10	7 or 8	8 to 10	18
6. LL/Dorsal	4 to 4 ¹ / ₂	4 ¹ / ₂	4 to 4 ¹ / ₂	6 ¹ / ₂
7. LL/Pelvic	2 to 2 ¹ / ₂	2 ¹ / ₂	2 ¹ / ₂	3
8. LL/Anal	2 ¹ / ₂	3 ¹ / ₂	2 ¹ / ₂ to 3	3 ¹ / ₂
9. Circumpeduncular	10 to 12	9	10	12
10. Pre-anal	11 to 14	16 or 17	15 to 17	22
11. Pre-pelvic	5 to 7	8 or 9	7 to 10	10
12. Gill-Rakers	5 + 12	3 + 9 or 10	0 + 12	
13. SL/LH	3.09 to 3.79	2.96 to 3.46	3.50	3.30 to 3.75
14. SL/Body depth	2.59 to 2.92	2.92 to 3.13	3.18 to 3.29	3.50 to 3.70
15. LH/Eye	3.05 to 3.70	3.37 to 3.73	3.33	4.00 to 4.50
16. LH/Snout	3.00 to 3.27	3.86 to 4.31	2.67 to 3.00	
17. IOW/Eye	1.11 to 1.39	1.20	1.00 to 1.08	1.00
18. Snout/Eye	1.10 to 1.22	0.87 to 0.88	1.00 to 1.35	
19. LCPD/HCPD	1.05 to 1.44	1.26 to 1.48	1.44 to 1.75	
20. Width of Mouth/IND	greater than IND	greater than IND	greater than IND	greater than IND
21. Dorsal fin base	equal to HCPD	greater than HCPD	greater than HCPD	greater than HCPD
22. Colour	A black spot at the base of anal	No spot on tail	No spot on tail	No spot on tail
23. Distribution	Burma	Pondicherry	Sri Lanka	Burma

Dorsal profile arched. Head short, compressed. Head length 28.87 to 33.73, body depth 31.93 to 34.22 in percent of standard length. Head width 42.86 to 51.85, height of head at occiput 73.21 to 79.63, snout 23.21 to 25.92 in percent of head length. Snout plain. Eyes large, 26.78 to 29.62 in percent of head length, 83.34 in percent of interorbital width and 114.28 to 115.33 of snout length. Mouth subterminal, its width greater than inter-nostril distance. Lips thin. Two pairs of barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray osseous, moderately strong and serrated. Dorsal fin base greater than least depth of caudal

peduncle. Pectoral fins extending to pelvic fins; latter reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 67.74 to 79.41 in percent of its length. Lateral complete.

Scales : PDS 7 or 8; Pre-anal 16 or 17; Pre-pelvic 8 or 9

Between LL and dorsal fin base	4 $\frac{1}{2}$
Between LL and pelvic fin base	2 $\frac{1}{2}$
Between LL and anal fin base	3 $\frac{1}{2}$
Circumpeduncular	9

Gill Rakers : 3 + 9 or 10

Size : 118mm TL

Colour : Silver, pelvic anal and caudal fins reddish, the lower border of the last tinged with black.

Distribution : INDIA: Pondicherry. Not subsequently recorded.

Relationships : Close to *P. sarana subnasutus* differing in scale counts and colouration.

Additional Data : N = 2

TL/Head length	22.88 to 26.41
TL/Body depth	25.00 to 27.12
SL/Pre dorsal	54.54 to 55.42
SL/Pre anal	71.66 to 73.49
SL/Pre pelvic	50.80 to 51.80
LH/LCPD	55.36 to 62.96
LH/HCPD	37.50 to 50.00
LH/Dorsal fin base	48.21 to 55.54
LH/Mouth width	23.21 to 25.92

Puntius pleurotaenia Bleeker

“Side Striped Barb”

Putius (Barbodes) pleurotaenia Bleeker, *Versal. Akad. Amsterdam*, 15, p.242, 1863 (type locality, Sri Lanka).- Bleeker, *Nat. Verh. Holl. Maatsch.*, 20, p.13, 1864.

Barbus pleurotaenia, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.120, 1868.- Day, *Fish India*, p.562, 1878.- Day, *Fauna Brit. India, Fish*, 1, p.302, 1889.

Barbus (Puntius) pleurotaenia, Hora, *Rec. Indian Mus.*, 44(2), p. 195, 1942 9(name only, Coorg, Nilgiris).

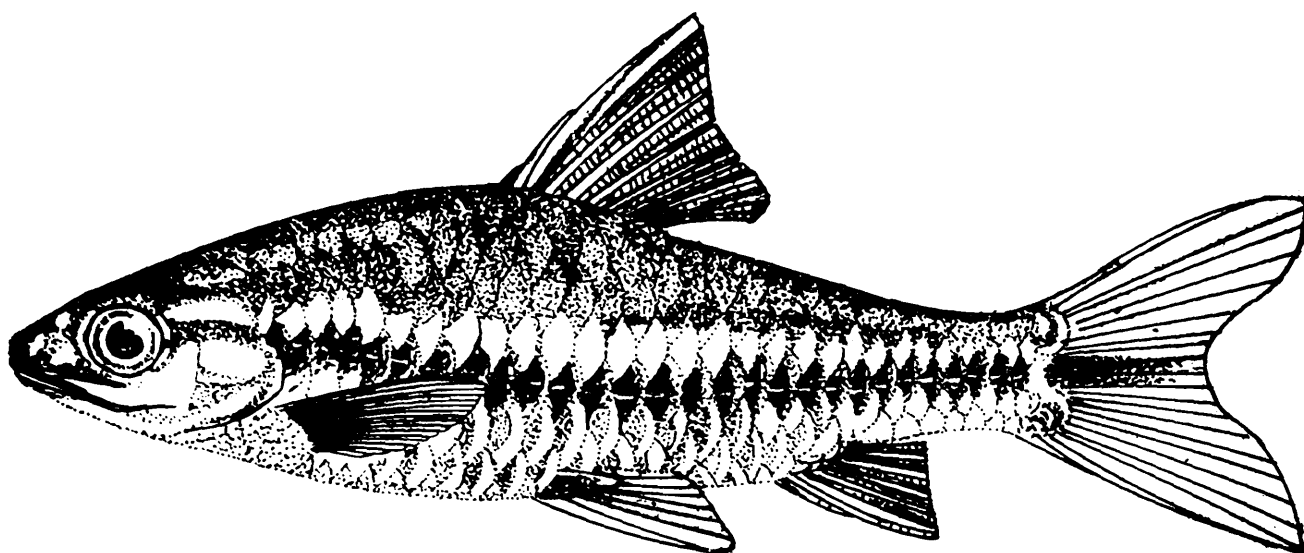
Puntius pleurotaenia, Deraniyagal. *Spolia Zeylanica*, 16(1), p.17, p.15. fig.2, 1930. 9a, (description, distribution in Sri Lanka).- Silas, *Bull. Nat. Inst. India*, No.7 p.251, 1952 (name only, Sri Lanka).- Munroe, *Marine & FW. Fish. Ceylon*, p.45, 1955 (synonymy, brief diagnosias, distribution in Sri Lanka).- Jayaram, *Handk. FW. Fish India*, p.102 (distribution), p.104 (key),1981.

Vernacular Names : *Hitha massa*, Sinhalese.

Specimens Studied : BMNH. 1981.1.21. 155-156, 20 exs., 70.00 mm SL, Upper Kondogala Ela, Gin Ganga, Sri Lanka, Scuhut coll. No.7

Diagnosis : A long fish with a longitudinal dark band from eye to caudal base along lateral line. Two pairs of barbels, dorsal ray osseous, strong, serrated. Lateral line complete with 26-30 scales.

Description : D. II, 7; P. i, 8; A. iii-iv, 4-5; C. 16 or 17; LL. 26-30.



Lateral view of *P. pleurotaenia*

Dorsal profile convex. Head conical. Head length 28.57, body depth 30.03 to 31.44 in percent of standard length. Head width 50.00 to 57.47, height of head at occiput 70.02 to 77.50, snout 33.33 to 37.45 in percent of head length, eyes 30.03 in percent of head length, 92.59 to 100.00 in interorbital space width and 74.07 to 100.00 in snout length. Mouth subterminal, its width greater than inter-nostril distance. Lips thin, plain. Two pairs of barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray osseous, strong, serrated. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 57.14 to 69.44 in percent of its length. Lateral line complete.

Scales : PDS 8 to 10; pre-anal 15 to 17; Pre-pelvic 7 to 10

Between LL and dorsal fin base 4 to 4½

Between LL and pelvic fin base 2½

Between LL and anal fin base 2½ to 3

Circumpeduncular 10

Gill Rakers : 0 + 12

Size : 87.0 mm TL

Colour : Greenish brown above, silvery below. A dark band from eye to tip of caudal fin along lateral line present. A few dots may be present below this occasionally. Above this a yellowish brown streak, both as wide as orbit. Belly white. Dorsal pale orange, remaining fins pale yellow.

Distribution : Sri Lanka.

Relationships : Related to *sarana* group differing as in Table 14.

Additional Data : N = 2

TL/Head length	22.98 to 23.12
TL/Body depth	24.15 to 25.44
SL/Pre dorsal	47.16 to 51.54
SL/Pre anal	74.07 to 75.75
SL/Pre pelvic	50.76 to 52.91
LH/Dorsal fin base	50.00 to 52.50
LH/LCPD	65.01 to 70.02
LH/HCPD	40.00 to 45.00
LH/Width of mouth	30.03 to 30.03

***Puntius compressiformis* (Cockerall)**

Barbus ompressus Boulenger (not of Day, 1869) *Ann. Mag. nat. Hist.* (6) 12, p.202, 1893 (type locality, Fort Stedman, S. Shan states, Burma. Name preoccupied by *B. compressus* Day, 1869 = *Tor compressus* (Day)).

Barbus compressiformis, Cockerall, *Bull. U.S. Bur. Fish.*, 32, p. 133, 1913 (proposed as substitute name for *B. compressus* Boulenger, 1893).

Barbus stedmanensis Boulenger, Annandale, *Rec. Indian Mus.*, 14, p.47 1918 (proposed *in litt.* as substitute name for *B. compressus* Boulenger, 1893).- Prashad & Mukerji, *Rec. Indian Mus.*, 31, p. 168, 1936 (name only distribution in Inle Lake).

Vernacular Names : NIL.

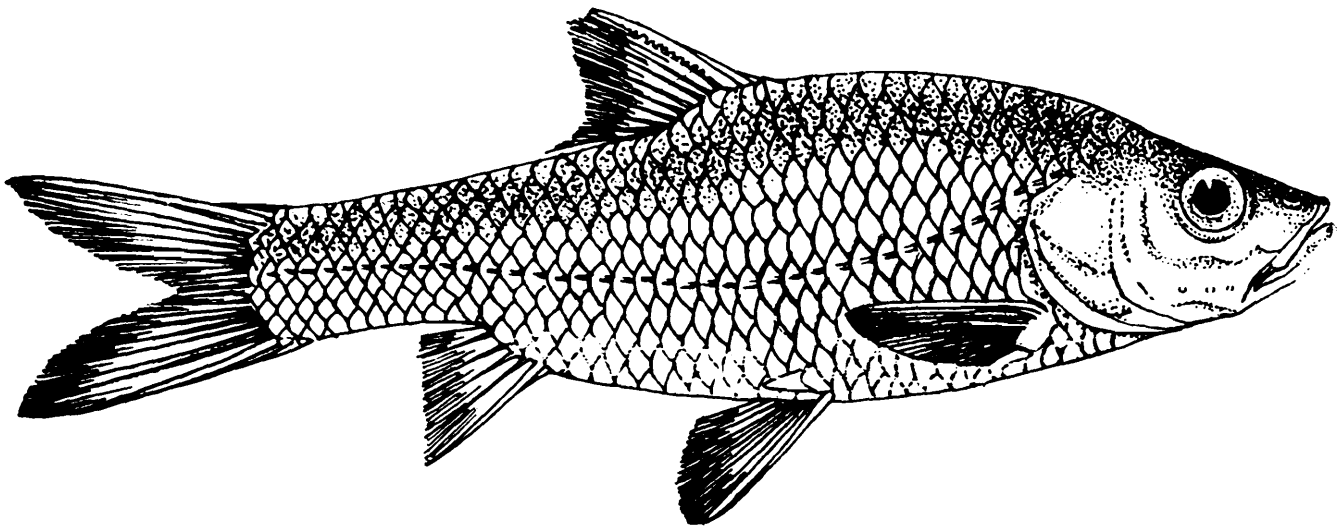
Specimens Studied : No specimen seen by me. Description based on Boulenger, 1893 and Annandale, 1918 and figure.

Diagnosis : A moderately deep bodied fish without any colour bands on body, four barbels, dorsal ray ossified, serrated, lateral line complete with 35 to 37 scales. Mouth slightly upturned, gape extending to below anterior border of eyes.

Description : D. IV, 8; P. i, 15; V. i, 8; A. ii, 5; C. 17; LL. 35-37.

Dorsal profile steep upto occiput, thereafter gentle, body herring like. Head moderate, blunt. Head length 26.67 to 30.30, body depth 27.03 to 28.57 in percent of total length. Snout pointed, plain. Eyes large, superior, 22.22 to 25.00 in percent of head length, and 100.00 of interorbital width. Mouth upturned, wide, its width greater than inter-nostril distance. Lips thin. Two pairs of barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray strong, ossified serrated with 17 to 22 teeth. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Lateral line complete.



Lateral view of *P. compressiformis*

Scales : (from figure) PDS. 18; Pre-anal 22; pre-pelvic 10

Between LL and dorsal fin base $6\frac{1}{2}$

Between LL and pelvic fin base 3

Between LL and anal fin base $3\frac{1}{2}$

Circumpeduncular 12

Size : 240 mm TL

Colour : In life almost black and the dorsal and caudal fins margined with same colour. Anal tip and upper border of pectoral fins infuscated.

Distribution : BURMA: Fort Stedman, Inle Lake, S. Shan states.

Relationships : Related to *P. sarana orphoides* differing from it in colouration, shape of mouth and body proportions.

The “*fasciatus*” group

Nine species and two subspecies constitute this group. All of them are confined to Peninsular India and Sri Lanka. They are characterised by the following common characters :-

- i. Body with vertically coloured bands ranging from three to seven (exception *afasciatus*)
- ii. Deep bodied 2.00 to 4.00 times in standard length.
- iii. Lateral line scales 18 to 24 (20 to 22 common).

- iv. Pre-dorsal scales 6 to 9 most often.
- v. Lateral line complete or incomplete.
- vi. 4 to 8 scales between pelvic and anal fins.

Four complexes can be formed out of the nine species as below:

I. *fasciatus* complex with

- 1.1. *P. fasciatus fasciatus* (Jerdon), 1849, p.305
- 1.2. *P. fasciatus pradhani* Tilak, 1973, p.97
- 2. *P. afasciatus* Jayaram, 1990

II. *arulius* complex with

- 3.1. *P. arulius arulius* (Jerdon), 1849, p.317
- 3.2. *P. arulius tambraparnei* Silas, 1953, p.34

III. *cumingii* complex with

- 4. *P. cumingii* (Gunther), 1868, p.155
- 5. *P. nigrofasciatus* (Gunther), 1868, p.155
- 6. *P. singhala* (Duncker), 1929, p.263
- 7. *P. titeya* Deraniyagala, 1929, p.73

IV. *narayani* complex with

- 8. *P. narayani* (Hora), 1937, p.24
- 9. *P. sahayadriensis* Silas, 1950, p.582.

It would seem that the *fasciatus* complex is the stock which has given rise to *arulius* complex from which *narayani* and *cumingii* complexes have evolved independently. The gradation of characters and the geographical pattern of distribution of the constituting species portray such an inference. Comparative tables of the four complexes and the species are appended.

The *fasciatus* complex (W. ghats only)

Common characters :

- i. Two pairs of barbels.
- ii. Last unbranched dorsal ray non-osseous weak, articulated or smooth.
- iii. Lateral line scales 18 to 22
- PDS 6 or 7
- LL/Dorsal 3 to 4½
- LL/Pelvic 2½ to 3
- LL/Anal 2½ to 3

Circumpeduncular	8 to 12 (10 to 12 common)
Scales between pelvic and anal	5 or 6

iv. Body with three to five vertical colour bands (exception *afasciatus*-no band).

TABLE - 15
Comparison of the four complexes of "*fasciatus*" group of *Puntius* species

Characters	" <i>fasciatus</i> " complex	" <i>arulius</i> " complex	" <i>cumingii</i> " complex	" <i>narayani</i> " complex
1. Number of barbels	Two pairs	One pair	No Barbels	No Barbels
2. Last unbranched dorsal fin ray	Non osseous, weak, articulated	Non osseous, weak, articulated or smooth	Osseous weakly serrated or smooth	Weak, non-osseous, articulated
3. Scales :				
i. LL	18 to 22	20 to 23	19 to 22	22 to 24
ii. PDS	6 or 7	7 to 9	7 to 11	7 or 8
iii. LL/Dorsal	3 to 4 ¹ / ₂	3 to 4 ¹ / ₂	2 ¹ / ₂ to 4 ¹ / ₂	3 ¹ / ₂ to 4 ¹ / ₂
iv. LL/Pelvic	2 ¹ / ₂ to 3	2 ¹ / ₂	2 ¹ / ₂ to 3 ¹ / ₂	2 ¹ / ₂ to 4 ¹ / ₂
v. LL/Anal	2 ¹ / ₂ to 3	2 ¹ / ₂ to 3 ¹ / ₂	2 ¹ / ₂ to 3 ¹ / ₂	3 to 4
vi. Circumpeduncular	8 to 12 (10 to 12 common)	8 or 9	8 to 10	10 to 12
vii. Between pelvic and anal fin	5 or 6	4 to 6	5 to 8	6 to 8
4. Number of vertical colour bands on body	3 to 5	3	2 or 3	3 to 7

Puntius fasciatus fasciatus (Jerdon)

Cirrhinus fasciatus (not of Bleeker) Jerdon, *Madras J. Lit. & Sci.*, p.305, 1849 (type locality, "streams of Malabar").

Labeo melanampyx Day, *Proc. zool. Soc. Lond.*, p.317, 1865 (type locality, Cochin).

Puntius melanampyx Day, *Fish. Malabar*, p.210, pl.16, fig.1, 1865.- Rajan, *J. Bombay nat. Hist. Soc.*, 53(1), p.45, 1955 (name only, Bhavani and Moyar rivers, Nilgiri Hills).

Barbus grayi Day, *Proc. zool. Soc.*, p.293, 1867.

Barbus arulius Gunther, *Cat. Fish. Brit. Mus.*, 7, p.133, 1868.

Barbus melanampyx Day, *Fish. India*, p.570, pl.139, fig. 1, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.316, 1889.- Jenkins, *Rec. Indian Mus.*, 3, p.289, 1909.- Hora, *Rec. Indian Mus.*, 39, p.8 (name only, Kottigehar village, Karnataka), 19 (name only, Cauvery river, Coorg), 1937.- Misra, *Rec. Indian Mus.*, 40, p.258, fig. 1938 (Nallamalai Hills, secondary sexual characters shown).

Barbus (Puntius) melanampyx, Hora & Law, *Rec. Indian Mus.*, 43, p.246, 1941 (Manimala river, Pampadampara, Kerala, sex dimorphism discussed).- Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (name only, Coorg, Wynaad, Nilgiris).- Silas, *J. Bombay nat. Hist. Soc.*, 49(4), p.673, 674, 1951 (name only, Puthuthottam estate, Valparai, Vannamudi Bridge, Anaimalai Hills, Ponnani drainage, Nelliampathi Hills, Periyar drainage, Kerala).

Puntius melanampyx melanampyx, Menon, Aq. J., San Francisco, 32, p.315-317, 1961 (sexual dimorphism).- Jayaram et al., Occ. Paper zool. Surv. India, No.36 p.60, 1982 (key, Cauvery river, S. India).

Puntius fasciatus, Silas, Copeia, No.3, p.194, 1956 (*Cirrhinus fasciatus*, Jerdon, 1849 & *Labeo melanampyx* Day, 1865 identified with *Cirrhinus fasciatus* Jerdon, 1849).

Vernacular Names : NIL

Specimens Studied : F 2719, ZSI Holotype, 42mm SL Cochin. ZSI, 1 ex, 36.5mm SL, Malampuzha dam, KCJ coll., Feb. 85. ZSI, SRS 545, 15 exs., 16.5 to 42.5mm SL, Cheriyaniam Tekkady, R.S. Pillai Coll., 15.2.81. F 2562/1, ZSI, 1 ex, 12 mm SL, Tenmalair

Diagnosis : A deep bodied fish with 2 or 3 vertical colour bands on body, 4 barbels, dorsal ray weak, non osseous, and a complete lateral line with 18 to 20 scales.

Description : D. i-ii, 8-9, P. 13-15, A. i-ii, 5; C. 15-16; LL. 18-20.

TABLE 16
Comparison of the species of the "*fasciatus*" complex

Characters	<i>P. fasciatus fasciatus</i> (Jerdon), 1849, p.305	<i>P. fasciatus pradhani</i> Tilak, 1973, p. 97	<i>P. afasciatus</i> Jayaram, 1990
1. Number of barbels	Four	Four	Four
2. Last unbranched dorsal ray	Weak articulated	Weak, articulated	Weak, smooth
3. Lateral line	Complete	Complete	Complete
4. LL scales	18 to 20	19 or 20	22
5. PDS	6 or 7	6 or 7	6
6. LL/Dorsal	3 to 3 $\frac{1}{2}$	3 $\frac{1}{2}$ to 4	4 $\frac{1}{2}$
7. LL/Pelvic	2 $\frac{1}{2}$ to 3	2 $\frac{1}{2}$ to 3	2 $\frac{1}{2}$
8. LL/Anal	2 $\frac{1}{2}$	2 $\frac{1}{2}$ to 3	2 $\frac{1}{2}$
9. Circumpeduncular	8 to 10	11 to 12	10
10. Pre-anal	11 or 10	10 to 13	12
11. Pre-pelvic	4 to 5	5 or 6	6
12. Gill-Rakers	4 + 10	4 + 7	
13. SL/LH	2.67 to 3.69	3.20 to 3.58	3.57
14. SL/Body depth	2.68 to 3.30	2.50 to 2.86	2.70
15. LH/Eye	3.05 to 3.75	2.83 to 3.42	3.68
16. LH/Snout	2.50 to 3.75	2.43 to 2.87	3.50
17. IOW/Eye	1.00 to 1.28	1.14 to 1.28	1.31
18. Snout/Eye	1.00 to 1.43	0.83 to 1.14	1.05
19. LCPD/HCPD	1.00 to 1.38	1.00 to 1.44	1.18
20. Width of mouth	equal to or less than IND	equal to IND	= or less than IND
21. Dorsal fin base	greater than HCPD	greater than HCPD	greater than HCPD
22. Colour	3 vertical bands	5 vertical bands	Nil
23. Distribution	Western Ghats	Goa	Nagerkoil, Tamil Nadu

Dorsal profile arched, convex, ventral profile slightly. Head short. Head length 27.06 to 37.50; body depth 30.30 to 37.33 in percent of standard length. Head width 52.00 to 63.64; height of at occiput 72.73 to 95.65; snout 26.67 to 40.00 in percent of head length. Snout conical with numerous pores. Eyes large, 26.67 to 32.73 in percent of head length, 77.78 to 100.00 in percent of interorbital width and 70.00 to 100.00 of snout length. Mouth subterminal, its width equal to or less than inter-nostril distance. Lips thin, plain. Two pairs of barbels.

Dorsal fin inserted midway between tip of snout and caudal base. Last unbranched dorsal ray, non osseous, weak. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvics, latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 72.22 to 100.00 in percent of its length. Lateral line complete.

Scales : PDS 6 or 7; Pre-pelvic 4 or 5; Pre-anal 10 or 11

Between LL and dorsal fin base	3 to 3 $\frac{1}{2}$
Between LL and pelvic fin base	2 $\frac{1}{2}$ to 3
Between LL and anal fin base	2 $\frac{1}{2}$
Circumpeduncular	8 to 10

Gill Rakers : 4 + 10

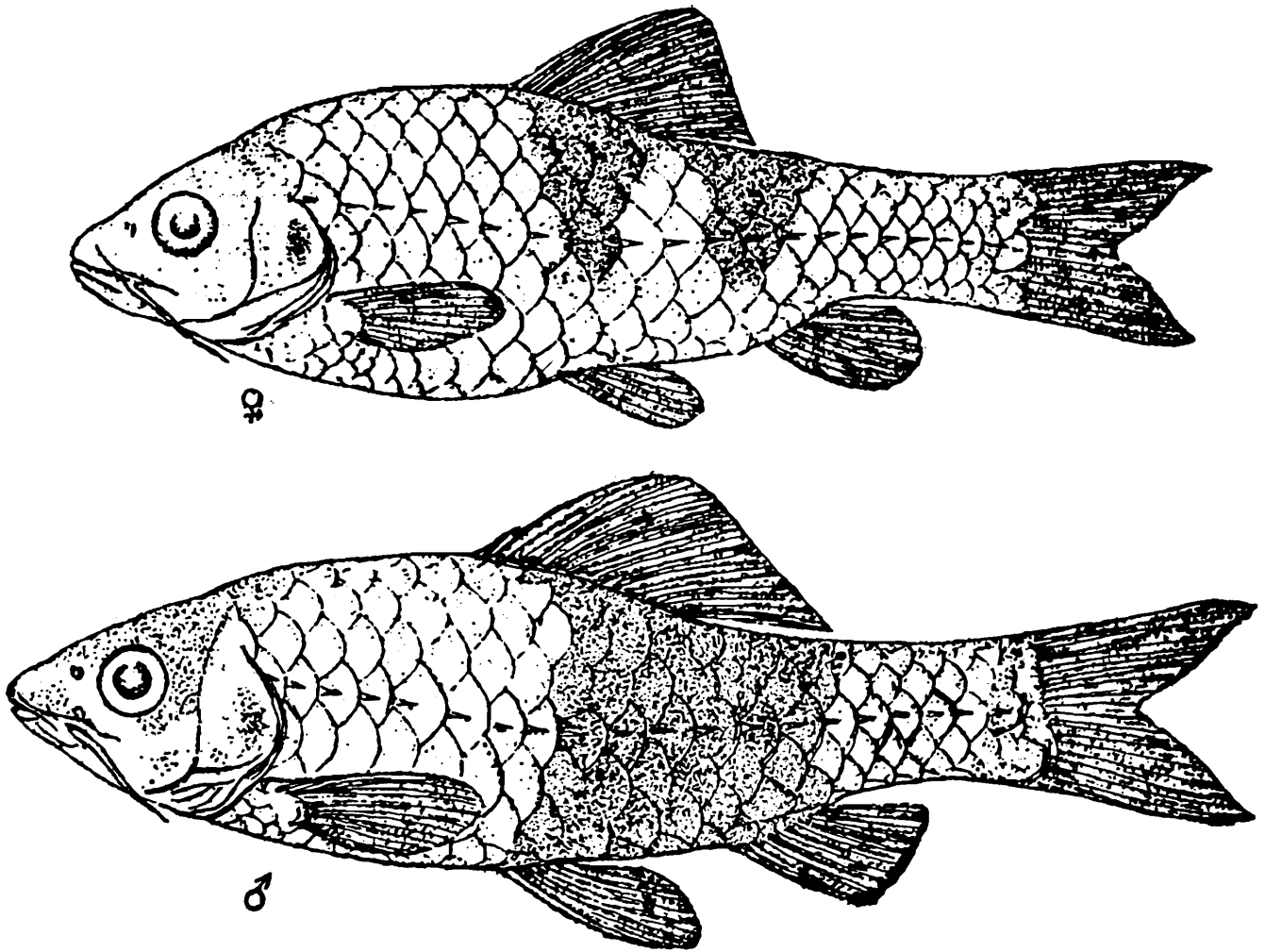
Size : 70 mm TL.

Colour : Body deep dull brick red, or light golden brown when fresh with 3 dark vertical bands; the first below the whole of the dorsal fin base, second commencing four scales beyond the posterior extremity of dorsal base and descending to just below the lateral line, the last is just before the caudal base and more often wanting. Except the dorsal band others may be in the form of an incomplete irregular speck or spot, and band, fins pinkish with black. A thin short, longitudinal stripe posterior to eye may be present in fresh examples. Snout may also be dark tinged.

Distribution : INDIA: Wynaad, Nilgiri hill range in Kerala and Karnataka. Also in the Cauvery river at the base of the hills, besides Nallamalai hills in the Eastern ghats (Misra 1938).

Relationships : Related to *P. arulius* differing from it in number of barbels and scale counts besides colouration.

Remarks : Misra (1938) recorded this species from Eastern ghats, subsequent to which it has not been collected further. However, this species is highly variable in respect of its colour pattern. Misra (1938) observed that the females have three black colour bands whereas the males only two. In the males the first band is very broad extending from the 9th to the 14th scale of the lateral line, covering about seven scales on the dorsal side and only three on the ventral side. The second band is just before the base of the caudal fin. The dorsal, pelvic, anal and caudal fins tip are tinged black. In the females there are three colour bands and only the dorsal fin is stained black. The males have tubercles on the snout which is absent in the females.



Lateral view of male and female of *P. fasciatus fasciatus*

The 15 examples examined by me from Tekkady exhibit the above variations. Three examples 49.0 to 55.0mm in TL are larger than the rest, are all males with only 2 bands, and the remaining 12 are smaller 22 to 29mm TL with 3 bands. Some of the 12 are not fully grown. Besides sexual variation the colouration may change it seems, with growth also in both sexes.

Silas (1956) clarified the nomenclature of this species. He showed that *Cirrhinus fasciatus* Jerdon, 1849 (p.305), *Labeo melanampyx* Day, 1865 and *Barbus grayi* Day, 1867 are all one and same species. Since the name *melanampyx* so far used has no priority, earlier name *fasciatus* is adopted.

Additional Data :

TL/Head length	20.72 to 25.86
TL/Body depth	22.73 to 28.57
SL/Pre dorsal	48.48 to 54.76
SL/Pre anal	66.67 to 75.29
SL/Pre pelvic	48.48 to 52.38
LH/LCPD	54.54 to 72.00
LH/HCPD	40.00 to 56.52
LH/Dorsal fin base	46.67 to 69.56
LH/Width of mouth	18.18 to 28.00

***Puntius fasciatus pradhani* Tilak**

Puntius melanampyx pradhani Tilak, *Rec. zool. Surv. India*, 67(1-4), p.97, 1973 (type locality, Rolem, Goa).- Jayaram, *Handbk. FW. Fish. India*, p.101, (distribution), p.106 (key), 1981.

Vernacular Names : NIL

Specimens Studied : F ZSI, F. 6166/2 and F.6167/2, 4 exs, Paratypes, 27 to 44mm SL Arvalem and Salgaam, Goa.

Diagnosis : A deep bodied fish with five coloured bands on body, with 4 barbels, dorsal spine weak and articulated and a complete lateral line. Dorsal fin 22.22 to 28.57 percent in total length.

Description : D. II-III, 8; P. i, 13-15; v.i, 8; A. ii-iii, 5; C. 19; LL. 19-20.

Dorsal profile more arched than ventral. Head moderate. Head length 27.93 to 31.25; body depth 34.96 to 40.00 in percent of standard length. Head width 53.33 to 61.67; height of head at occiput 83.33 to 100.00; snout 34.84 to 41.15 in percent of head length. Snout short, with many small tubercles in the male. Eyes 29.24 to 35.33 in percent of head length, 78.13 to 87.72 in percent of interorbital width and 87.72 to 120.48 of snout length. Mouth subterminal, its width equal to inter-nostril distance. Lips thin, papillated. Two pairs of barbels.

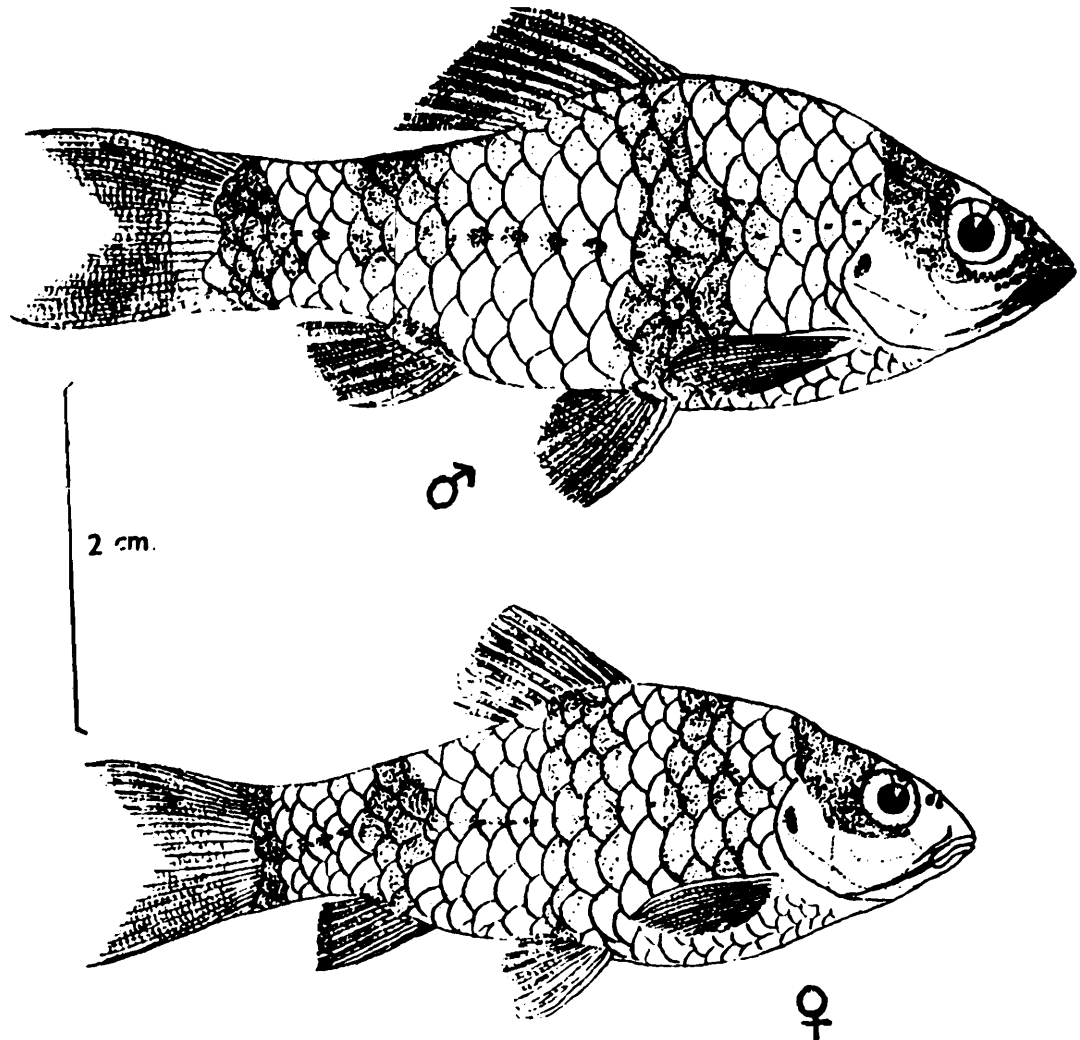
Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched ray weak and articulated. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins extending to pelvic fins, in males only latter not reaching anal opening. Anal; fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 69.44 to 100.00 in its length. Lateral line complete.

Scales : PDS 6 or 7; Pre-pelvic 5 or 6; Pre-anal 10 to 13

Between LL and dorsal fin base	3 $\frac{1}{2}$ to 4
Between LL and pelvic fin base	2 $\frac{1}{2}$ to 3
Between LL and anal fin base	2 $\frac{1}{2}$ to 3
Circumpeduncular	11 or 12

Gill Rakers : 4 + 7

Size : 59mm male, 51mm female TL



Lateral view of male and female of *F. fasciatus pradhani*

Colour : There is marked sexual dimorphism in this species in respect of colour and other characters.

Female : Five coloured bands on body; first deeply dark across the nape and on each side running along posterior margin of eye. Second from back nearly 2 scales in front of dorsal base and running downwards to middle of pectoral fin. Third from base of anterior four divided dorsal rays and running to behind base of pelvics and joining its counterpart on the other side, thus encircling the body completely. Fourth from the back, 2 scales behind end of dorsal fin base and running down to base of posterior part of anal fin. Fifth at the base of the caudal fin equalling in width to that of last two scales. Besides the five bands, the base of scales are dark spotted, especially those along the lateral line giving an appearance of a

row of dark spots. A black spot on operculum is also present. Anterior rays of dorsal fin are dusky, while the anal and dorsal fins are tipped black. Ventral side of body yellowish, except a dark band behind the pelvics.

Male : Tip of snout, upper and lower jaws are dark stained. Second and third bands described above in female have almost fused with one another. Band at caudal base broader covering 3 scales. Dorsal, pelvics and anal fins are uniformly dark with their tips deeply stained. Pectoral and caudal fins dusky.

Distribution : INDIA: Goa.

Relationships : Close to *P. fasciatus* (Jerdon) differing as below:-

Characters	<i>P. fasciatus fasciatus</i>	<i>P. fasciatus pradhani</i>
Iow/Eye	1.0 to 2.28	1.14-1.28
TL/Dorsal fin length	5.9 male 6.0-6.5 Female	3.5-3.75 Male 4.0-4.5 Female
Colour	No additional band	An additional band in front of dorsal fin

Additional Data :

T/L Head length	21.05 to 23.43	N = 4
TL/Body depth	26.56 to 28.95	N = 4
SL/Pre dorsal	44.44 to 57.57	N = 4
SL/Pre anal	50.00 to 72.73	N = 4
SL/Pre pelvic	44.44 to 53.03	N = 4
LH/Mouth width	22.22 to 26.67	N = 4
LH/LCPD	66.67 to 93.33	N = 4
LH/HCPD	53.33 to 66.67	N = 4
LH/Dorsal fin base	58.33 to 81.25	N = 4

***Puntius afasciatus* Jayaram**

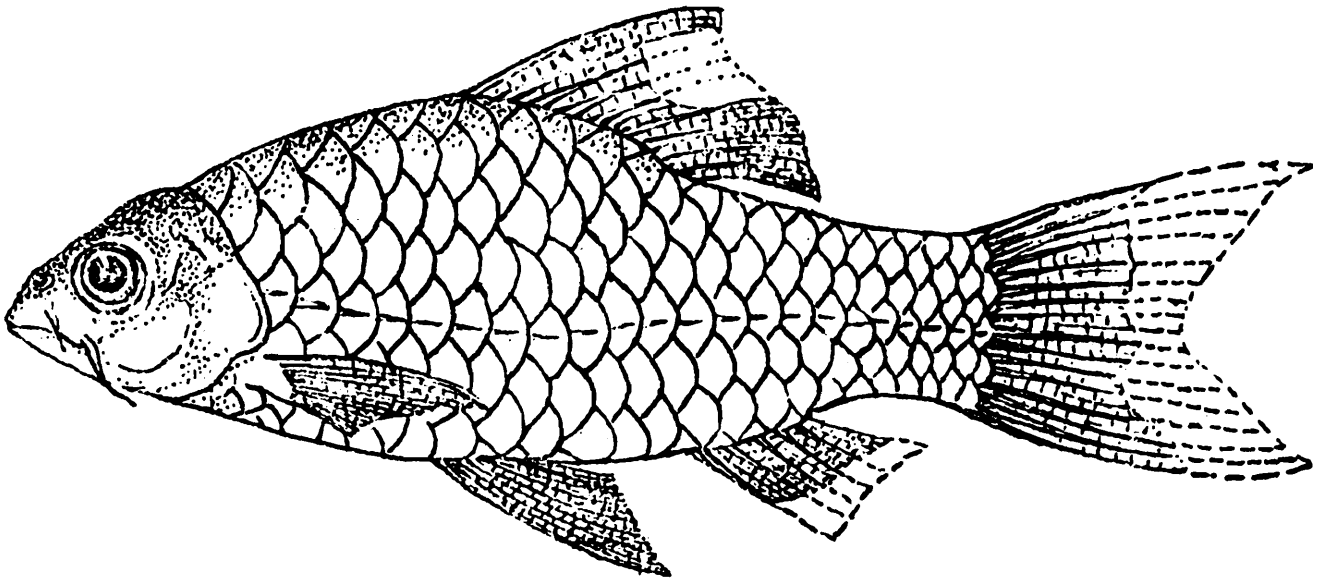
Puntius afasciatus Jayaram, *J. Bombay nat. Hist. Soc.*, 86 (3 & 4), 1990 (type locality, Vellakaravi and Vathakad Village, Nagercoil, Kanniyakumari dist., Tamil Nadu,).

Vernacular Names : NIL

Specimens Studied : F.2985/2, ZSI, Holotype, 50 mm SL, Vellakarvai and Vathakad village, Nagercoil, Tamil Nadu (with a name label *P. melanampyx kanniyakumarei* Menon & Sareen).

Diagnosis : A deep bodied fish without any vertical bands, last unbranched dorsal ray weak and smooth, and a complete leteral line with 22 scales, dorsal fin with 9 branched rays, four barbels.

Description : D. I, 9; P. 15; V. i, 8; A. ii, 5; C. 16; LL. 22.

Lateral view of *P. afasciatus*

Dorsal profile steeply arched, ventral profile gently. Head short, conical. Head length 28.00; body depth 37.00 in percent of standard length. Head width 57.14; height of head at occiput 85.71; snout 28.57 in percent of head length. Snout plain, smooth. Eyes large 27.14 in percent of head length, 73.00 in percent of interorbital width and 95.00 of snout length. Mouth subterminal, narrow, its width less than inter-nostril distance. Lips thin, plain. Two pairs of barbels.

Dorsal fin inserted nearer caudal base than tip of snout. Last unbranched dorsal ray weak, smooth. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvics; latter not reaching anal opening. Anal fin when laid flat reaches root of caudal fin. Least depth of caudal peduncle 88.89 in percent of its length. Lateral line complete.

<i>Scales</i> :	PDS 6; Pre-pelvic 6; Pre anal 12	
	Between LL and dorsal fin base	4 $\frac{1}{2}$
	Between LL and pelvic fin base	2 $\frac{1}{2}$
	Between LL and anal fin base	2 $\frac{1}{2}$
	Circumpeduncular	10

Gill Rakers : Not taken

Size : 60 mm TL

Distribution : INDIA: Nagercoil, Kanniyakumari dist., Tamil Nadu.

Relationships : Differs from *P. fasciatus fasciatus* in absence of colour bands, in having 9 branched rays in dorsal fin and 22 scales on lateral line.

Remarks : The material which form the basis of this new species was present in the reserve type collections of ZSI, Calcutta under the name *P. melanampyx kanniyakumarei* Menon & Sareen. I have made extensive enquiries and also searched literature to find that this name is never published and thus becomes a *nomen nudum*. Hence it is described as a new species.

Additional Data :

TL/Head length	23.33
TL/Body depth	30.83
SL/Pre dorsal	52.00
SL/Pre anal	74.00
SL/Pre pelvic	51.00
LH/LCPD	64.28
LH/HCPD	57.14
LH/Dorsal fin base	71.43
LH/Width of mouth	88.89

The “*arulius*” complex

(S. India only, ghats and plains & Sri Lanka)

Common Characters :

- 1 Only one pair of barbels (maxillary)
2. Last unbranched dorsal ray smooth or articulated, non osseous, weak.
3. Lateral line scales 20 to 23

PDS	7 to 9
LL/Dorsal	3 to 4 $\frac{1}{2}$
LL/Pelvic	2 $\frac{1}{2}$
LL/anal	2 $\frac{1}{2}$ to 3 $\frac{1}{2}$
Circumpeduncular scales between pelvic and anal fin	8 or 9 4 to 6
4. Body with three vertically coloured bands.

TABLE 17
Comparison of the species of the "fasciatus" group the "arulius" complex

Characters	<i>P. arulius arulius</i> (Jerdon), 1849, p. 317	<i>P. arulius tambra</i> <i>paranei</i> Silas, 1953, p. 34	<i>P. arulius srilankensis</i> (Senanayake, 1982)
1. Number of barbels	Two	Two	Two
2. Last unbranched dorsal ray	Non osseous, weak	Non osseous, weak	Non osseous, weak
3. Lateral line	Complete	Complete	Complete
4. LL scales	20 to 23	21 to 23	22 or 23
5. PDS	7 to 9	7 to 8	7
6. LL/Dorsal	3 to 4 $\frac{1}{2}$	4	4 $\frac{1}{2}$
7. LL/Pelvic	2 $\frac{1}{2}$	2 $\frac{1}{2}$	1 $\frac{1}{2}$
8. LL/Anal	2 $\frac{1}{2}$ to 3	3 $\frac{1}{2}$	2 $\frac{1}{2}$
9. Circumpeduncular	8 to 9	8 or 9	10
10. Pre-anal	10 to 12	13	13
11. Pre-pelvic	5 to 6	9	8
12. Gill-Rakers	3 + 10 to 12	—	—
13. SL/LH	2.83 to 3.50	3.00 to 4.00	3.96 to 4.2
14. SL/Body depth	2.47 to 3.17	2.59 to 4.00	3.03 to 3.1
15. LH/Eye	3.08 to 3.83	2.66 to 3.75	3.24 to 3.76
16. LH/Snout	2.80 to 4.17	2.60 to 4.00	3.08 to 3.29
17. IOW/Eye	1.00 to 1.30	1.00 to 1.39	1.35 to 1.44
18. Snout/Eye	0.75 to 1.25	0.66 to 1.25	1.00 to 1.22
19. LCPD/HCPD	1.20 to 1.56	1.15 to 1.66	1.30
20. Width of Mouth	equal to or less than IND	less than IND	equal to IND
21. Dorsal fin base	greater than HCPD	greater than HCPD	equal to HCPD
22. Colour	3 vertical bands	3 vertical bands	3 dark oblong spots
23. Distribution	Western Ghats South India	Tambraparny River, South India	Sri Lanka

Puntius arulius arulius (Jerdon)

Systemus arulius Jerdon, *Madras J. Lit. Sci.*, 15, p.317, 1849 (type locality, Cauvery river, Srirangapatnam, Kamataka).

Barbus arulius, Day, *Fish. India*, p.575, pl.142, fig.5, 1878.- Day, *Fauna Brit. India Fish.*, 1, p.322, 1889.- Jenkins, *Rec. Indian Mus.*, 3, p.289, 1909.- Mukerji, *J. Bombay nat. Hist. Soc.*, 35, p.163, 1932 (redescription).

Barbus (Puntius) arulius, Hora & Law, *Rec. Indian Mus.*, 43, pp.237, 241, 1941 (distributed throughout Peninsular India).

Puntius arulius, Silas, *Rec. Indian Mus.*, 51(1) p.33, 1953 (Mukerji, 1932 material reexamined).

Puntius arulius arulius, Jayaram, *Handbk. FW. Fish. India*, p.99 (distribution) p.108 (key, 1981.- Jayaram *et al.* *Occ. Paper, zool. Surv. India*, No. 36, p.51, 1982 (key, Cauvery river, S. India).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.36, 1984 (common and vernacular names).

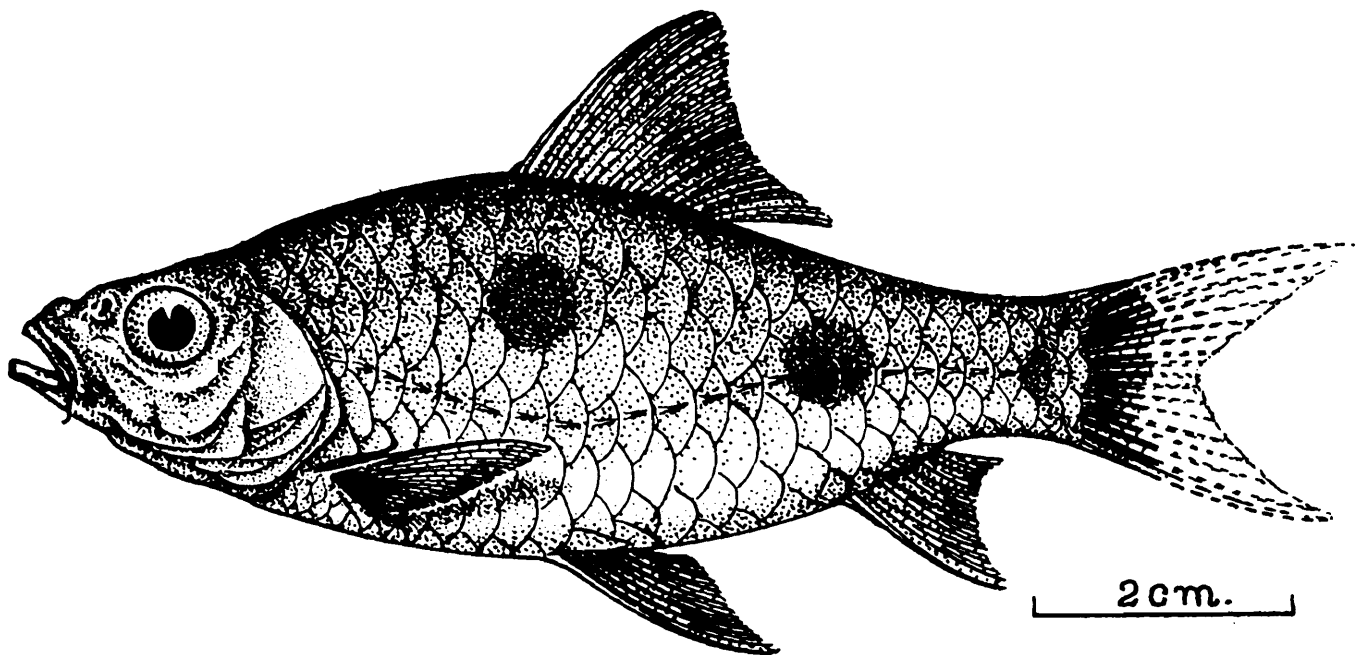
Vernacular Names : *Aruli*, Kan.

Specimens Studied : ZSI SRS, 2 Ureg exs; from Muthanga, Wynaad, 73.5 & 74 mm SL R.S. Pillai coll., 12.10.76; ZSI, SRS, 20 unreg exs; 51-72 mm SL, Malampuzha dam, Wynaad, KCJ coll., Feb. 85.

ZSI, F.2732, 1 ex; 84 mm SL Wynaad; ZSI, f 8069/1, 1 ex., 38 mm SL. Travancore.

Diagnosis : A deep bodied fish with 3 vertical colour bands on body, 2 barbels, a weak non osseous dorsal ray, and lateral line complete.

Description : D. ii-iii, 8; P. 14-17; V i, 8; A. i-ii, 5; C. 16-17; LL. 20-23.



Lateral view of *P. arulius*

Dorsal profile steeply arched, ventral profile equally so. Head short, conical. Head length 28.57 to 35.29; body depth 31.57 to 40.54 in percent of standard length. Head width 44.00 to 52.38; height of head at occiput 67.39 to 80.39; snout 24.00 to 35.71 in percent of head length. Snout obtusely rounded, plain. Eyes 26.09 to 32.50 in percent of head length, 76.92 to 100.00 in percent of interorbital width, 80.00 to 133.33 of snout length. Mouth subterminal, its width equal to or less than inter-nostril distance. Lips thin, plain. A pair of long maxillary barbels.

Dorsal fin inserted midway between tip of snout and caudal base. Last unbranched dorsal ray non-osseous and weak. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins extending to pelvics; latter reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 64.00 to 83.33 in percent of its length. Lateral line complete.

Scales :	PDS 7-9; Pre-pelvic 5-6; Pre-anal	10-12
	Between LL and dorsal fin base	3-4 $\frac{1}{2}$
	Between Ll and pelvic fin base	2 $\frac{1}{2}$

Between LL and anal fin base	2 $\frac{1}{2}$ -3
Circumpeduncular	8 or 9

Gill Rakers : 3 + 10-12

Size : 95 mm TL

Colour : Light brown with three black bars vertically on body, first below origin of dorsal fin to as low as lateral line, second below posterior extremity of dorsal to base of anal, and a third across the free portion of the tail before the caudal fin. Dorsal, caudal and anal pinkish with a black bar across the summit of the first, whilst the caudal is stained at its edges. In live condition, the fish is olive green on the back becoming silvery white dashed with reddish green over the abdomen.

Distribution : INDIA: Wynaad and Nilgiri Hills. Also known from the Cauvery river in its middle and upper reaches in Karnataka.

Relationships : Belongs to the *fasciatus* complex of *Puntius* species with vertical colour bands on body. Close to *P. fasciatus fasciatus* differing from it in having 2 barbels, colouration, and other characters (see table 17).

Remarks : Mukerji (1932) redescribed this species from seven examples including the original of Day's (1878) fig. 5, pl.142 in Fish India (ZSI. No.2732) from Nilgiris, collected by Dr. F. Day. Of these ZSI F.5535 from Nilgiris, collected by Dr. Day is referable to *P. fasciatus fasciatus* as opined by Silas (1953). The others belong to *P. arulius arulius*.

The scales are very thin and deciduous.

Additional Data :

TL/Head length	21.76 to 27.78	N = 7
TL/Body depth	31.57 to 40.54	N = 7
SL/Pre dorsal	48.21 to 54.05	N = 7
SL/Pre anal	68.63 to 75.59	N = 7
SL/Pre pelvic	48.98 to 55.26	N = 7
LH/LCPD	52.17 to 76.19	N = 6
LH/HCPD	38.89 to 44.44	N = 7
LH/Dorsal fin base	48.00 to 67.50	N = 7
LH/Width of mouth	20.00 to 27.45	N = 6

Puntius arulius tambraparniei Silas

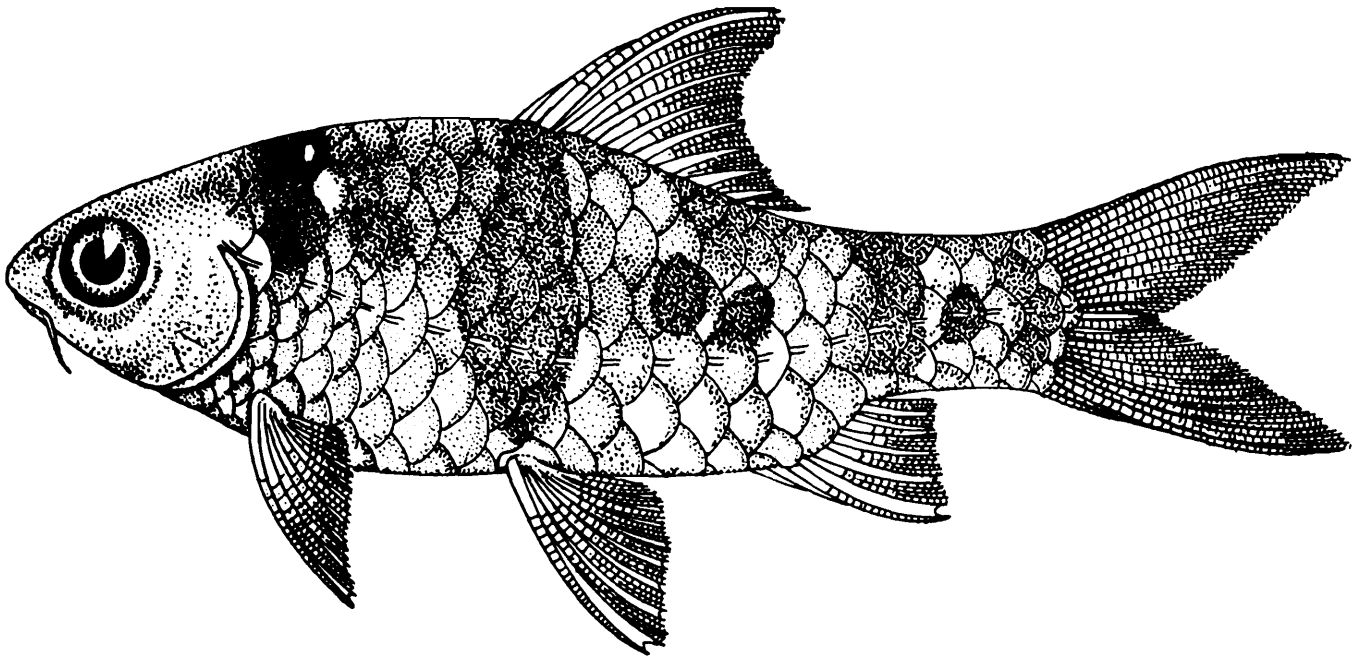
Puntius arulius tambraparniei Silas, *Rec. Indian Mus.*, 51(2), p.34, fig.2,3, 1953 (type locality, Tambraparny river near Kalladakurichi, Tamil Nadu).- Jayaram, *Handbk. FW. Fish. India*, p.99 (distribution), p.108 (key) 1981.

Vernacular Names : NIL

Specimens Studied : NIL. Description after Silas, 1953.

Diagnosis : A deep bodied fish with 3 vertical colour bands on body, 2 barbels, a weak non osseous dorsal ray and complete lateral line. Eyes, head, body slightly smaller than the nominal species.

Description : D. iii, 8-9; P. 14-15; V i, 8; A. ii, 5; C. 18-19; LL 21-23.



Lateral view of *P. arulius tampirarniei*

Dorsal and ventral profiles arched. Head short, head length 25.00 to 33.33; body depth 25.00 to 38.61 in percent of standard length. Head width 50.00 to 83.33; height of head at occiput 62.50 to 84.75; snout 25.00 to 38.46 in percent of head length. Snout obtusely rounded, plain. Eyes large, just visible from below ventral surface, 26.67 to 37.59 in percent of head length, 71.43 to 100.00 in percent of interorbital width, 80.00 to 151.51 of snout length. Mouth subterminal, its width less than inter-nostril distance. Lips thin, plain. A pair of well developed maxillary barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsay ray non-ossseous and weak. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins not extending to pelvics, latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 60.24 to 86.21 in percent of its length. Lateral line complete.

Scales : PDS 7 or 8; pre-pelvic 9; Pre-anal 13

Between LL and dorsal fin base	4
Between LL and pelvic fin base	2½
Between LL and anal fin base	3½
Circumpeduncular	Not known ? 8 or 9.

Gill Rakers : Not known.

Size : 92 mm TL

Colour : Variable. Small examples ranging from 22 to 30 mm, SL have three vertical blotches or bands on sides of the body; the first below the insertion of the dorsal fin, the second below the posterior extremity of the dorsal fin and extending to the base of the caudal

fin. In specimens ranging than 31 to 49 mm SL, in addition to these vertical blotches or bands, a few more bands are present. One is above the upper angle of the gill opening and extends dorsally, two others are on the dorso-median line. Except the dorso-median bands all others coalesce with their fellow on the other side. The outer rays of the fins are stained dark, but in inner portion is pinkish. Further, a few pigment spots are present behind and above gill openings which in larger specimens (50 to 92 mm) is well defined and take the form of a dark blotch. The larger example has a black blotch on the lateral line anterior to the anal fin and another on the caudal peduncle.

Male specimens may have a few of the branched dorsal fin rays produced as a filament and the snout with tubercles.

Distribution : INDIA: Tambraparni river, near Kalladakurichi, Tirunelveli, Tamil Nadu, S. India.

Relationships : Close to the nominal species differing from it in colouration and distribution. The band below dorsal fin is prominent unlike in the nominal species.

Remarks : Holotype F.735/2 ZSI, Paratypes 12, F 735/2, ZSI are not traceable.

***Puntius arulius srilankensis* (Senanayake)**

Barbus srilankensis Senanyake, *Ceylon J. Sci. Biol. Sci.*, 15(1 & 2), p.166, figs. 1, 2. 1982 (type locality Kalu Ganga, Pallegama, Eastern Sri Lanka).

Vernacular Names : NIL

Specimens Studied : CAS 34955, 1 ex., (Paratype), Kalu Ganga, Pallegama, Sri Lanka, 67.1 mm SL, Senanayake coll. 1976.

Diagnosis : A deep bodied fish with 22-23 scales on lateral line, a pair of maxillary barbels, 3 vertical black spots over body, head 23.21 to 26.13, body depth 31.87 to 33.79 in percent of standard length. Dorsal fin base equal to least depth of caudal peduncle.

Description : D. iii, 8; P. i, 18; V. i, 8; A. iii, 5; C. 15; LL. 22-23.

Dorsal profile arched, ventral profile equally so. Head short, conical. Head length 23.21 to 26.13; body depth 31.87 to 33.79 in percent of standard length. Head width 52.91, height of head at occiput 79.37, snout 30.39 to 32.46 in percent of head length. Snout projecting well beyond upper jaw. Eyes 26.59 to 30.86 in percent of head length, 69.44 to 74.07 in percent of interorbital width, 81.96 to 100.00 of snout length. Mouth subterminal, crescentic, its width equal to internostril distance. Lips thin, plain. A well formed rhinal furrow, a deeply incised groove marking off the upper boundary of the rostral fold rising vertically from maxillary groove terminating before reaching level of nostrils present. A pair of short maxillary barbels.

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray non osseous and weak. Dorsal fin base equal to least depth of caudal peduncle. Pectoral fins not extending to pelvics; latter reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 76.92 in percent of its length. Lateral line complete.

Scales :	PDS 7; Pre pelvic 8; Pre anal 13	
	Between LL and dorsal fin base	4 $\frac{1}{2}$
	LL and pelvic fin base	1 $\frac{1}{2}$
	LL and anal fin base	2 $\frac{1}{2}$
	Circumpeduncular	10

Gill Rakers : Not taken.

Size : 74.5 mm. SL.

Colour : In life scales on sides silvery and edged with red, color increasing above lateral line, giving an overall red appearance. Belly white and dorsum greenish. A green opercular spot and 3 black vertical oblong spots on body; first 2 or 3 scale wide on the vertex; second 2-2 1/2 scales wide behind dorsal fin, and the third irregular blotch at caudal base. Caudal fin edged black on first 2 to 4 branched rays on either side, but is overall suffused with red.

Sexual dimorphism seem. Dorsal fin rays elongated in the male as in *P. filamentosus*.

Distribution : Sri Lanka.

Relationships : Differs from the nominal form in having lesser number of scales between LL and pelvic fin base, a shorter head.

Remarks : Senanayake (1982) considered his fish as more akin to *P. filamentosus*. Rarely *P. filamentosus* exhibits 3 spots on body. The fish is best kept as a subspecies of *P. aralius aralius* as can be seen from Table 17.

Additional Data	of paratype of	CAS 34955
TL/Head length		19.76
TL/Body depth		25.58
SL/Pre dorsal		47.85
SL/Pre anal		69.44
SL/Pre pelvic		47.85
LH/LCPD		76.34
LH/HCPD		58.82
LH/Dorsal fin base		58.82
LH/Width of mouth		17.64

The "cumingii" Complex

Species :

1. *P. cumingii* (Gunther), 1868, p.155.
2. *P. nigrofasciatus* (Gunther), 1868. p.155.

3. *P. singhala* (Duncker), 1912, p. 263.
4. *P. titeya* Deraniyagala, 1929, p. 23.

Common Characters :

1. Lateral line scales 19 to 22.
2. LL/Pelvic scales $2\frac{1}{2}$ to $3\frac{1}{2}$.
3. LL/Anal scales $2\frac{1}{2}$ to $3\frac{1}{2}$.
4. Circumpeduncular scales 8 to 10.
5. Body with vertical coloured bands.
6. All endemic in Sri Lanka.

A Comparison is presented in table 18.

***Puntius cuningii* (Gunther)**
 “Cuning’s two-banded barb”

Puntius phutunio, Bleeker, *Nat. Verh. Holl. Maatsch. Wetensch.*, 2, Verz., 20, p.12, pl.4, fig.4, 1864 (type locality, Sri Lanka).

Barbus cuningii, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.155, 1868,- Day, *Fish. India*, p.578, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.328, 1889.- Hora, Misra and Malik, *Rec. Indian Mus.*, 41, p.273, 1939 (comparison with *ticto* and related species).

Puntius cuningii, Deraniyagala, *Spolia Zeylanica*, 16(1), p.20, pl.2, fig.2, 1930 (description, distribution in Sri Lanka).- Herre, *Spolia Zeylanica*, 24(3), p.175, 1946 (Nambapana, Peradeniya, Sri Lanka).- Silas, *Bull. Nat. Inst. Sci. India*, No.7, p.251, 1952 (name only, Sri Lanka).- Munroe, *Marine & FW. Fish Ceylon*, p.46, 1955 (Sri Lanka).- Jayaram, *Handbk. FW. Fish. India*, p.100 (distribution), p.109 (key), 1981.

Vernacular Names : *Pothaya*, Sinhalese

Specimens Studied : BMNH. 1981 - 1 - 21 - 420 - 425, six exs., 28.0 to 34.0 mm SL, Kelani Ganga, Gampaha, Mahasa, Sri Lanka, Schut Coll. No.47.

Diagnosis : A deep bodied fish with two vertical colour bands on body, no barbels, dorsal ray osseous, serrated, an incomplete lateral line with 5 or 6 scales between pelvic and anal fins.

Description : D. I-II, 7 or 8; P. 12 or 13; V. i, 8; A. i-iii, 5 or 6; C. 15 to 17; LL. 19 to 21.

Dorsal profile more convex than that of ventral. Head short, 27.59 to 30.88, body depth 42.86 to 50.00 in percent of standard length. Head width 50.00 to 62.50, height of head at occiput 73.68 to 100.00; snout 31.58 to 38.09 in percent of head length. Snout plain, smooth. Eyes large, in middle of head, 28.57 to 37.50 in percent of head length, 75.00 to 100.00 in percent of interorbital width and also of snout length. Mouth inferior, narrow, its width less than internostril distance. Lips thin, plain. No barbels.

Dorsal fin inserted midway between tip of snout and caudal fin base. Last unbranched dorsal ray osseous, serrated, serrations becoming indistinct with growth. Dorsal fin base generally greater than least depth of caudal peduncle, may be equal to it occasionally. Pectoral fins extend to pelvics; latter not reaching anal opening. Anal fin when laid flat not

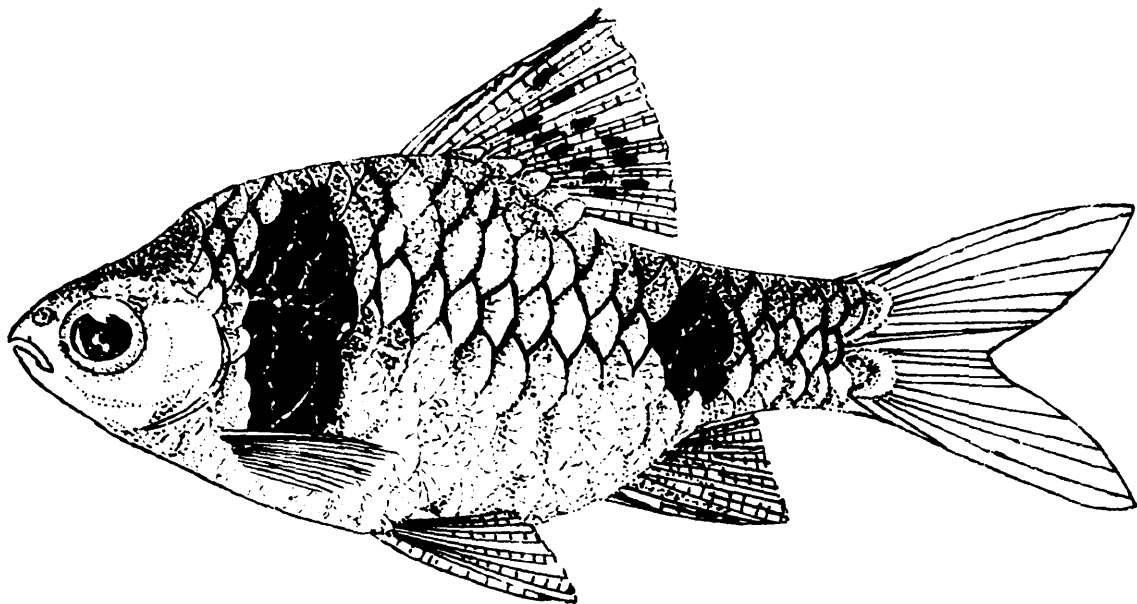
reaching root of caudal fin. Least depth of caudal peduncle 57.14 to 62.50 in percent of its length. Lateral line incomplete, ceasing after 5 or 6 scales.

Scales : PDS 9 to 11; Pre-anal 10 or 11; Pre-pelvic 5 or 6

Between LL and dorsal fin base	3½ to 4
Between LL and pelvic fin base	3½
Between LL and anal fin base	2½ to 3½
Circumpeduncular	8 to 10

Gill Rakers : 9 + 13

Size : 50 mm TL.



Lateral view of *P. cumingii*

Colour : Body brown with two black vertical bands, one descending to middle of pectoral fin and another across the free portion of the tail above anal fin. Each scale with a silvery streak which is not seen in preserved material.

Distribution : Sri Lanka.

Relationships : Belongs to the *fasciatus* group of species and closely forming a complex with *P. nigrofasciatus*, *P. singhala* and *P. titeya* all from Sri Lanka. (see table 18).

Remarks : Bleeker (1864) described this species as *P. phutunio*. It may be recalled that Hamilton (1822) also described another species of *Puntius* as *Cyprinus phutunio*, which has priority.

Additional Data : N = 6

TL/LH	20.45 to 22.83
TL/Body depth	31.82 to 36.96

SL/Pre dorsal	50.00 to 58.82
SL/Pre anal	68.96 to 73.53
SL/Pre pelvic	48.21 to 53.97
LH/LCPD	63.16 to 75.00
LH/HCPD	57.14 to 62.50
LH/Dorsal fin base	52.63 to 87.50
LH/Width of mouth	19.04 to 25.00

***Puntius nigrofasciatus* (Gunther)**

“Three banded crimson Barb or Black Ruby Barb”

Barbus nigrofasciatus Gunther, *Cat. Fish. Brit. Mus.*, 7, p.155, 1868 (type locality, Sri Lanka), - Day, *Fish. India*, p.578, pl.144, fig.6. - Day, *Fauna Brit. India, Fish.*, 1, p.328, 1889. - Hora, Misra & Malik, *Rec. Indian Mus.*, 41, p.273, 1939 (relationship with *ticto* compared)

Puntius nigrofasciatus, Deraniyagala, *Spolia Zeylanica*, 16(1) p.16, pl.3, fig.1, 1930 (description, distribution in Sri Lanka). - Herre, *Spolia Zeylanica*, 24(3), p.175 1946 (Gilimale, Ratnapura). - Silas, *Bull. Nat. Inst. Sci. India*, No.7, p.251, 1952 (name only, Sri Lanka). Munroe, *Marine & FW. Fish. Ceylon*, p.45, 1955 (synonymy, brief diagnosis, distribution in Sri Lanka). - Jayaram, *Handbk. Fw. Fish. India*, p.101 (distribution), p.109 (key), 1981. - Jayaram, *et. al.*, *Occ. Paper zool. Surv. India*, No.36, p.61, 1982 (key, Cauvery river, S. India record of Chacko *et al.* (1954) doubted).

Vernacular Names : *Bulath sapeya*, Sinhalese

Specimens Studied : BMNH 1982.12.29-5-10, 6 exs., 29.0 to 39.0 mm SL Mameliya jungle river, Galle Distt., Sri Lanka, B. Brewster & R. Bulner coll. 14-10-1982.

Diagnosis : A deep bodied fish with a steep rise from occiput to dorsal fin base, three vertical colour bands on body, no barbels, dorsal ray osseous, partly serrated, lateral line complete. Caudal and pectoral fins plain without bands.

Description : D. II,8; P. i,12 - 13; V. i, 8; A. i-ii,5; C. 16-18; LL. 20-21.

Dorsal and ventral profiles equally convex. Head short conical. Head length 30.77 to 34.48, body depth 39.66 to 47.44 in percent of standard length. Head width 45.00 to 60.00, height of head at occiput 77.27 to 94.74, snout length 29.17 to 36.36 in percent of head length. Snout conical, plain. Eyes large, in middle of head, 30.00 to 35.00 in percent of head length. 75.00 to 100.00 in percent of interorbital width, and 87.50 to 116.67 of snout length. Mouth subterminal, its width less than or equal to inter-nostril distance. Lips thin, plain. No barbels.

Dorsal fin inserted midway or nearer base of caudal than tip of snout. Last unbranched dorsal ray osseous, strong, smooth at base, serrated in middle, may be with a filamentous tip. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins just extending to pelvics; latter reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 62.50 to 92.86 in percent of its length. Lateral line complete.

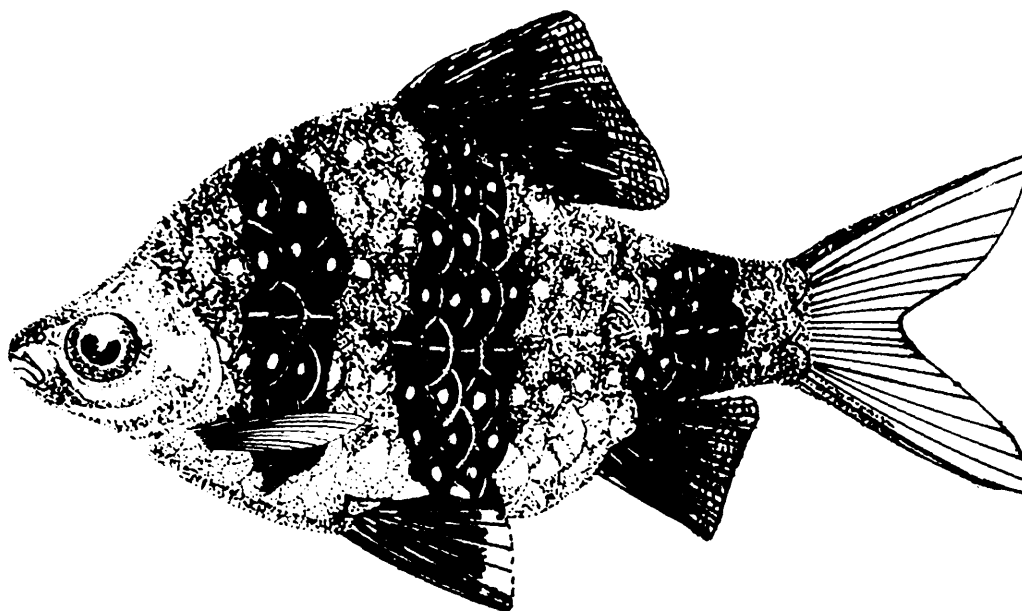
Scales : PDS 8 or 9; Pre-anal 11; Pre-pelvic 5 or 6

Between LL and dorsal fin base $4\frac{1}{2}$

Between LL and pelvic fin base	$3\frac{1}{2}$
Between LL and anal fin base	$3\frac{1}{2}$
Circumpeduncular	10

Gill Rakers : 4 + 9

Size : 60 mm TL



Lateral view of *P. nigrofasciatus*

Colour : All shades of olive and coral pink with 3 dark indigo-blue vertical bands on body. Scales with shiny or gold central spots which persist in the dark bands. The anterior band is 2 or 3 scales wide and extends from before dorsal fin to below middle of pectoral; the median band is 3 or 4 scales wide, extends from base of dorsal to above middle of pelvics; the last is also 3 or 4 scales wide, and lies just behind base of anal. Head and snout pale crimson, belly white or crimson in all specimens. Dorsal and caudal orange, other fins hyaline. In older specimens dorsal, ventral and anal partially or entirely black. Caudal a bright red. Eyes orange or yellow.

Distribution : Sri Lanka.

Relationships : Related to *P. cuningii* differing from it in scale counts and having three colour bands.

Additional Data N = 6

TL/Head length	22.99 to 26.67
TL/Body depth	25.92 to 35.29
SL/Predorsal	50.00 to 56.72
SL/Pre anal	56.72 to 71.79

TABLE 18
Comparison of the species of the "cumingii" complex

Characters	<i>P. cumingii</i> (Gunther) 1868, p.155	<i>P. nigrofasciatus</i> (Gunther), 1868 p.155.	<i>P. singhala</i> (Duncker) 1912, p.263	<i>P. titeya</i> Deraniyagala, 1929, p.23
1. Number of barbels	NIL	NIL	NIL	Two
2. Last unbranched dorsal ray	Osseous, serrated	Moderately osseous partly serrated	Non-osseous smooth	Osseous, weakly serrated
3. Lateral line	Incomplete	Complete	Complete	Incomplete
4. LL Scales	19 to 21	20 or 21	20 to 22	19 or 20
5. PDS	9 to 11	8 or 9	7	7 or 8
6. LL/Dorsal	3 ¹ / ₂ to 4	4 ¹ / ₂	4 ¹ / ₂	2 ¹ / ₂
7. LL/Pelvic	3 ¹ / ₂	3 ¹ / ₂	2 ¹ / ₂	2 ¹ / ₂ to 3 ¹ / ₂
8. LL/Anal	2 ¹ / ₂ to 3 ¹ / ₂	3 ¹ / ₂	2 ¹ / ₂	2 ¹ / ₂
9. Circumpeduncular	8 to 10	10	9 or 10	8 or 9
10. Pre-anal	10 or 11	11	12	9
11. Pre-pelvic	5 or 6	5 or 6	7	5
12. Gill-Rakers	9 + 13	4 + 9	3 + 9	-
13. SL/LH	3.24 to 3.62	2.90 to 3.25	2.91 to 3.40	3.12
14. SL/Body depth	2.00 to 2.33	2.11 to 2.52	3.20 to 3.78	3.33
15. LH/Eye	2.67 to 3.50	2.86 to 3.33	1.67 to 2.75	5.33
16. LH/Snout	2.63 to 3.17	2.75 to 3.43	2.50 to 2.75	4.00
17. IOW/Eye	1.00 to 1.33	1.00 to 1.33	0.75 to 0.80	1.00
18. Snout/Eye	1.00 to 1.33	0.86 to 1.14	0.67 to 1.00	1.33
19. LCPD/HCPD	1.60 to 1.75	1.08 to 1.60	1.20 to 1.33	1.50
20. Width of Mouth	Less than IND	Equal to or Less than IND	Less than IND	Equal to IND
21. Dorsal fin base	= or greater than HCPD	greater than HCPD	greater than HCPD	less than HCPD
22. Colour	2 vertical bands	3 vertical bands	3 vertical bands	3 horizontal bands
23. Distribution	Sri Lanka	Sri Lanka	Sri Lanka	Sri Lanka

SL/Pre pelvic	48.33 to 52.24
LH/LCPD	68.18 to 80.00
LH/HCPD	42.11 to 65.00
LH/Width of Mouth	16.67 to 21.05
LH/Dorsal fin base	60.00 to 75.00

***Puntius singhala* (Duncker)**
 "Black banded barb"

Barbus singhala Duncker, *Susswasserfische Ceylon*, p.263, 1912 (type locality, Sri Lanka).

Puntius singhala, Deraniyagala, *Spolia Zeylanica* 16(1), p.11, pl.2, fig.1, 1930 (description, distribution in Sri Lanka).- Herre, *Spolia Zeylanica*, 24(3), p.175, 1946 (Peradeniya, Sri Lanka).- Silas, *Bull. Nat. Sci. India*, No.7, p.251, 1952 (name only, Sri Lanka).- Jayaram, *Handbk. FW. Fish. India*, p.102, (distribution), p.110 (key), 1981.

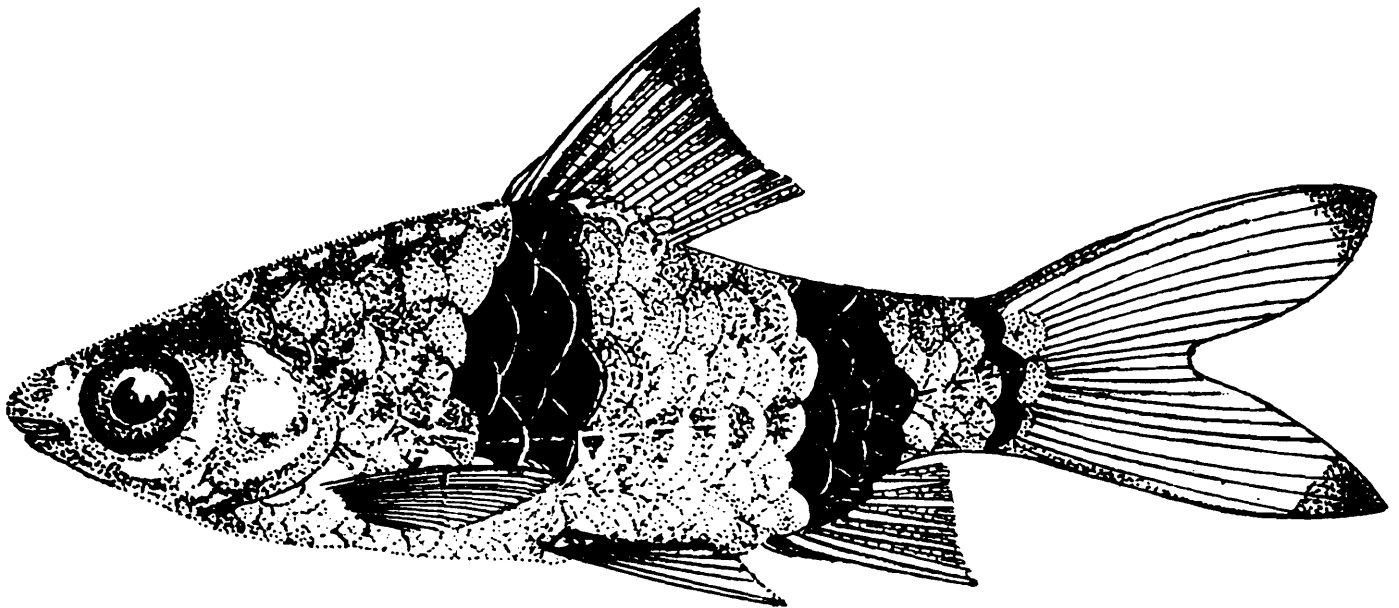
Puntius melanampyx singhala, Munroe, *Marine & FW. Fish. Ceylon*, p.43, 1955 (synonymy, brief diagnosis, distribution in Sri Lanka).

Vernacular Names : *Pullititeya, Sri titiya, Goma titeya, Titha kadeya*, Sinhalese.

Diagnosis : A moderately elongated fish with 3 vertical colour bands on body, no barbels, dorsal ray weak, nonosseous, smooth, lateral line complete.

Specimens Studied : ZSI, F.6039/2, 3 exs., 15.0 to 17.0 mm SL, Ceylon, P.E.P.Deraniyagala donated. (badly preserved).

Description : D. I-II, 8; P. i, 14-15; V i, 8; A. ii-iii, 5-6; C. 18; LL. 20-22.



Lateral view of *P. singhala*

Dorsal profile gently convex, upto posterior end of dorsal fin. Head large, conical. Head length 29.41 to 34.38, body depth 26.47 to 31.25 in percent of standard length. Width of head 54.54 to 60.00, height of head at occiput 63.64 to 90.00; snout 36.36 to 40.00 in percent of

head length. Snout conical, plain. Eyes large, in middle of head 36.36 to 60.00 in percent of head length, 125.00 to 133.00 in percent of interorbital width and 100.00 to 150.00 of snout length. Mouth subterminal, its width less than inter-nostril distance. Lips thin, plain. No barbels.

Dorsal fin inserted nearer to caudal fin base than to tip of snout. Last unbranched dorsal ray non-osseous, weak, smooth, short. Dorsal fin base greater than least depth of caudal peduncle, may be lesser also. Pectoral fins extend to pelvics; latter reaching anal opening.

Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 75.00 to 83.33 in percent of its length. Leateral line complete.

Scales : PDS 7; Pre-anal 12; Pre-pelvic 7

Between LL and dorsal fin base	4 $\frac{1}{2}$
Between LL and pelvic fin base	2 $\frac{1}{2}$
Between LL and anal fin base	2 $\frac{1}{2}$
Circumpeduncular	9 or 10.

Gill Rakers : 3 + 9

Size : 30 mm TL

Colour : Ground colour a very light red, pale brown dorsally with three dark brown or black cross bands across body; first one from base of two anterior dorsal rays to below tip of pectoral; second from behind dorsal to anterior part of anal base and third around caudal base. Caudal fin lobes tipped black besides dorsal fin upper edges. Juveniles may have their pelvics black based.

Distribution : Sri Lanka.

Relationships : Close to *P. cumingii* differing from it in having greater number of circumpeduncular scales and lateral line scales besides colouration.

Remarks : Tilak (1973) correctly doubted the inclusion of *singhala* as a subspecies of *P. fasciatus* (= *melanampyx*) by Munroe (1955) since in his opinion the two differ in the number of barbels. *P. fasciatus fasciatus* has four barbels whereas *singhala* has none.

Additional Data : N = 3

SL/Pre dorsal	50.00 to 60.00
SL/Pre anal	73.33 to 81.25
SL/Pre pelvic	50.00 to 53.33
LH/LCPD	60.00 to 80.00
LH/HCPD	50.00 to 60.00
LH/Dorsal fin base	50.00 to 60.00

***Puntius titteya* Deraniyagala**
 “Cherry Barlb”

Puntius titteya Deraniyagala, *Ceylon J. Sci. Sect. B*, 15, p.73, 1929 (type locality, Sri Lanka).- Deraniyagala, *Spolia Zeylanica*, 16(1), p.22, 1930 (description, distribution in Sri Lanka).- Herre, *Spolia Zeylanica*, 24(3), p.175, 1946 (Dambuva, Vekvella).- Munroe, *Marine & FW. Fish. Ceylon*, p.46 1955 (synonymy, brief diagnosis, distribution in Sri Lanka).- Jayaram, *Handbk. FW. Fish. India*, p.103 (distribution), p.107 (key), 1981.

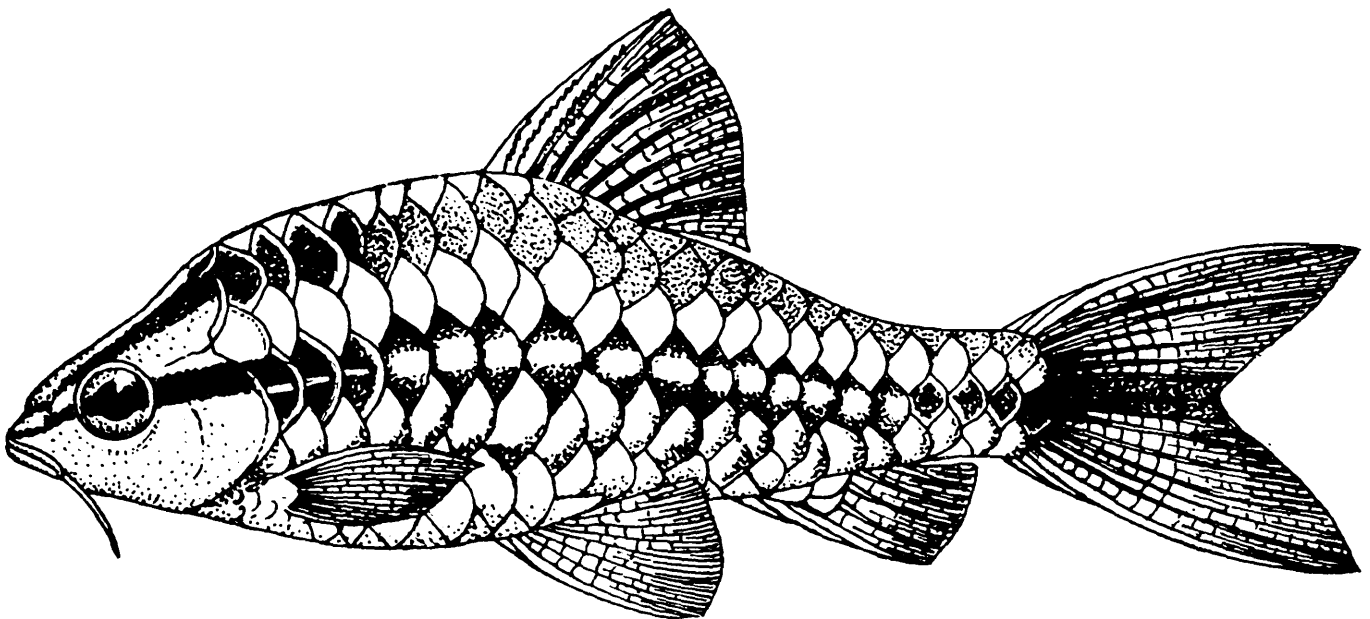
Vernacular Names : *Lai tileya, Dola titteya, Vairan titteya, Kondhaya*, Sinhalese.

Specimens Studied : ZSI, F.11044/1, 1 ex, 25 mm SL., Deran, Sri Lanka.

Diagnosis : A deep bodied fish with two maxillary barbels, dorsal ray weakly osseous, serrated, lateral line incomplete with 19 or 20 scales, ceasing after 3 or 4 scales. Body with 2 lateral bands and blotches.

Description : D. III, 7; P. i, 13; V i-ii, 7 or 8; A. iii, 5; C. 16 or 17; LL. 19-20.

Dorsal profile convex with an abrupt drop after base of dorsal fin and in old specimens the back humps up behind the vertex. Head length 32.00, body depth 30.00 in percent of standard length. Head width 50.00, height of head at occiput 75.00, snout 25.00 in percent of head length. Snout conical, plain. Eyes superior 18.75 in percent of head length, 100.00 in percent of interorbital width and 75.00 of snout length. Mouth subterminal, its width equal to inter-nostril distance. Lips thin, plain. A pair of barbels.



Lateral view of *P. titteya*

Dorsal fin inserted nearer tip of snout than caudal base. Last unbranched dorsal ray weakly osseous, faintly serrated. Dorsal fin base less than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 66.67 in percent of its length. Lateral line incomplete ceasing after 3 or 4 scales.

<i>Scales</i> :	PDS 7 or 8; Pre-anal 9; Pre-pelvic 5
	Between LL and dorsal fin base $2\frac{1}{2}$
	Between LL and pelvic fin base $2\frac{1}{2}$ to $3\frac{1}{2}$
	Between LL and anal fin base $2\frac{1}{2}$
	Circumpeduncular 8 or 9

Gill Rakers : Not taken.

Size : 31 mm TL.

Colour : Chocolate brown dorsally, pink ventrally or a uniform crimson. A dark lateral line runs from upper tip through mid eye to end of median rays. Above this a yellow line and below it 10 black blotches broader than long and extending from shoulder to base of anal. Below this another row of 2 or 3 blotches are present. A median green line from snout to vertex enclosed in a "U" shaped black mark extending a short distance posteriorly and a black line from vertex to origin of dorsal fin. Dorsally olive brown with a crimson band upon the lateral black band, sides yellow, belly white or yellow with red lunules in some cases. Fins crimson or deep orange.

Distribution : Sri Lanka.

Relationships : Related to *P. cumingii* differing from it in having a pair of maxillary barbels and colouration.

Additional Data : N = 1

TL/Head length	25.00
TL/Body depth	23.43
SL/Pre dorsal	52.00
SL/Pre anal	76.00
SL/Pre pelvic	50.00
LH/LCPD	75.00
LH/HCPD	50.00
LH/Dorsal fin base	43.75
LH/Width of mouth	25.00

The "*narayani*" complex (W. ghats)

Common characters :

- (i) No barbels.
- (ii) Last unbranched dorsal ray weak, articulated
- (iii) PDS 8 or 7
 - LL/Dorsal $3\frac{1}{2}$ to $4\frac{1}{2}$
 - LL/Pelvic $2\frac{1}{2}$ to $4\frac{1}{2}$

LL/Anal	3 to 4
Circumpeduncular	10 to 12
Lateral line scales	22 to 24
Scales between pelvic and anal fins	6 or 8
(iv) Body with 3 to 7 vertical colour bands.	

TABLE 19
Comparison of the species of the "narayani" complex

Characters	<i>P. narayani</i> (Hora) 1937, p.24	<i>P. sahayadriensis</i> Silas, 1950, p.582
1. Number of barbels	NIL	NIL
2. Last unbranched dorsal ray	Weak, articulated	Weak, articulated
3. Lateral line	Complete	Complete
4. LL scales	22 or 23	23 or 24
5. PDS	7 or 8	8
6. LL/Dorsal	3 ¹ / ₂ to 4 ¹ / ₂	4 ¹ / ₂
7. LL/Pelvic	2 ¹ / ₂ to 4	4 ¹ / ₂
8. LL/Anal	3 - 4	3 ¹ / ₂
9. Circumpeduncular	10 to 12	10
10. Pre-anal	12 to 14	13
11. Pre-pelvic	6 to 8	6
12. Gill-Rakers	3 + 12	-
13. SL/LH	3.32 to 4.08	3.00 to 4.00
14. SL/Body depth	2.42 to 2.75	2.60 to 3.00
15. LH/Eye	2.75 to 3.50	2.75 to 3.50
16. LH/Snout	2.35 to 3.20	-
17. IOW/Eye	1.00 to 2.00	-
18. Snout/Eye	0.90 to 1.33	-
19. LCPD/HCPD	1.04 to 1.40	1.00 to 1.50
20. Width of mouth	equal to IND	-
21. Dorsal fin base	greater than HCPD	greater than HCPD
22. Colour	3 vertical bands	7 vertical bands
23. Distribution	Coorg, Sahayadri range, W. ghats.	Mahabaleshwar

Puntius narayani (Hora)

Barbus narayani Hora, *Rec. Indian Mus.*, 39(1), p.24, 1937 (type locality, Cauvery river, Coorg, Karnataka).- David, *Proc. nat. Inst. Sci. India*, 22(B) (3), p.153, 1956 (Bhadra river at Bhadravati).- Menon & Yazdani, *Rec. zool. Surv. India*, 61(1 & 2), p.105, 1968 (Syntypes in ZSI).

Barbus (Puntius) narayani Hora, *Rec. Indian Mus.*, 44(2), p.195, 1942 (name only. Coorg, Wynaad).

Puntius narayani Jayaram, *Handbk. FW. Fish. India*, p.101 (distribution), p.110 (key), 1981.- Jayaram *et al.*, *Occ. Paper zool. Surv. India*, No.36, p.61, 1982 (key, Cauvery river, S. India).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.37, 1984 (Common & Vernacular names).

Vernacular Names : *Narayani*, Kan.

Specimens Studied : ZSI F.12180/1, Holotype, 47 mm TL, Cauvery river, Coorg, C.R.N. Rao Coll.

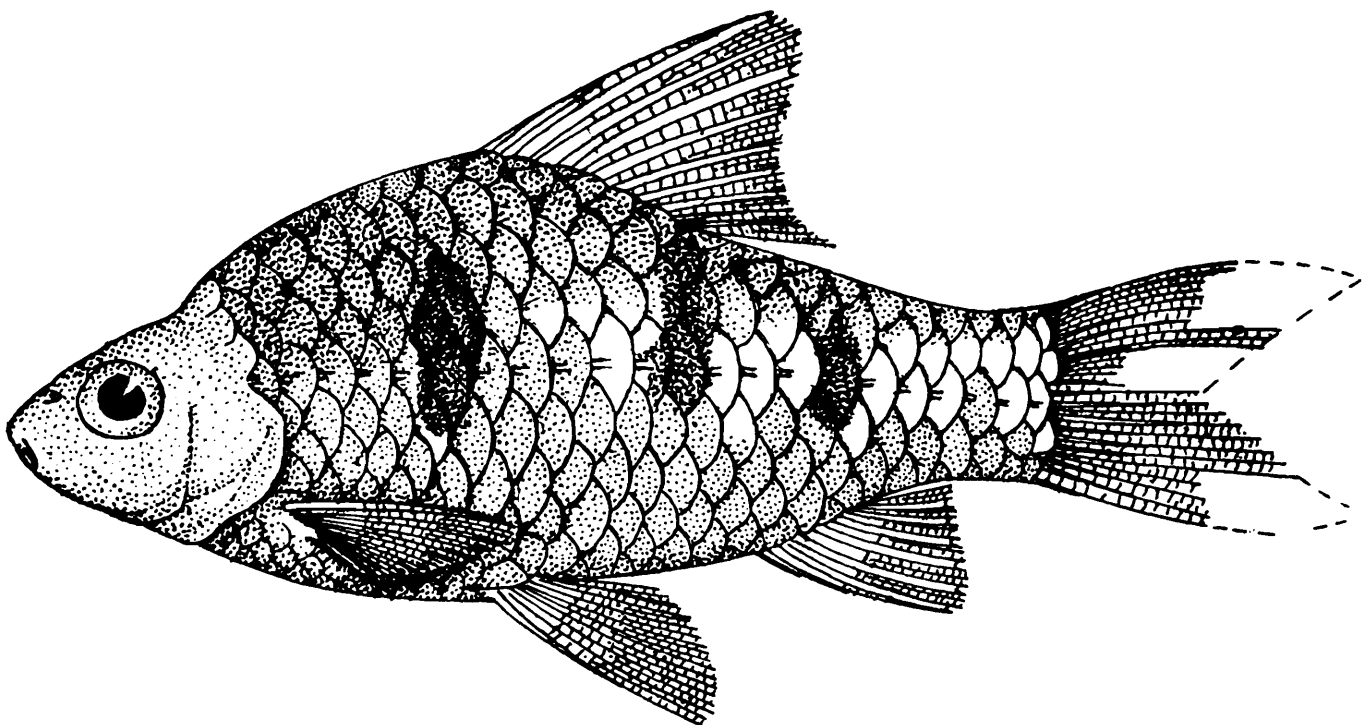
ZSI, SRS Unregd. 5 exs., 50.5 to 61.0 mm SL, River Krishna at Menavali Village, near Dhom reservoir, Satara district, Maharashtra State, 2.1.88, KCJ Coll.

ZSI, SRS Unregd. 1 ex., 46.5 mm SL, Karad fish market, Purchased, catch reported from River Krishna, Satara district, Maharashtra State, 30.12.87, KCJ Coll.

Diagnosis : A deep bodied fish with three vertical colour bands on body, no barbels, dorsal ray weak and articulated, lateral line complete, with 10 to 12 circumpeduncular scales and 3 or 4 scales between lateral line and anal fin.

Description : D. III 9; P. 11-14; V i, 7-8; A. i-ii, 5 or 6; C. 16-18; LL. 22 or 23.

Dorsal and ventral profiles greatly arched, former more than the latter. Head length 24.50 to 30.12; body depth 39.21 to 41.32 in percent of standard length. Head width 37.58 to 71.43, height of head at occiput 50.00 to 100.00, snout 28.57 to 90.90 in percent of head length. Snout short, blunt. Eyes large, 28.57 to 50.00 in percent of head length, 69.44 to 100.00 in percent of interorbital width and 75.18 to 111.11 of snout length. Mouth small, somewhat oblique, its width equal to inter-nostril distance. Lips fleshy, continuous, *studded with minute spines* (females may be bereft of these). No barbels.



Lateral view of *P narayani*

Dorsal fin inserted in advance of the pelvic fins, nearer tip of snout than caudal fin base. Last unbranched dorsal ray weak, articulated. Dorsal fin base greater than pelvic fins; latter in turn just reach anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 71.42 to 95.24 in percent of its length. Lateral line complete.

Scales : PDS 7 or 8; Pre-anal 12-14; Pre-pelvic 6 to 8

Between LL and dorsal fin base	$3\frac{1}{2} - 4\frac{1}{2}$
Between LL and pelvic fin base	$2\frac{1}{2} - 4$
Between LL and anal fin base	3 - 4
Circumpeduncular	10 to 12

Gill Rakers : 3 + 12

Size : 77.5 mm TL

Colour : Greyish brown. Three vertical black marks on body, first below commencement of dorsal, second below or just behind dorsal and the third above posterior half of anal fin.

Jayaram *et al.*, (1982) state that in life the caudal fin is tipped red along upper and lower lobes.

Distribution : INDIA : Rivers Cauvery and Krishna in the Karnataka and Maharashtra stretch of Western ghats. The record of this species from Krishna drainage in the Sahayadri range is for the first time and is geographically interesting.

Relationships : Belongs to *P. fasciatus* complex of species. Close to the "*cumingii*" group from which it differs in number of colour bands, and scale counts.

Additional Data :

TL/Head length	20.00 to 22.62	N = 6
TL/Body depth	27.47 to 31.64	N = 6
SL/Pre dorsal	40.00 to 51.54	N = 6
SL/Pre anal	65.78 to 75.75	N = 7
SL/Pre pelvic	43.10 to 50.00	N = 7
LH/LCPD	66.66 to 85.47	N = 6
LH/HCPD	50.00 to 66.67	N = 6
LH/Dorsal fin base	50.00 to 83.33	N = 7
LH/Width of mouth	21.73 to 33.33	N = 6

Puntius sahayadriensis Silas

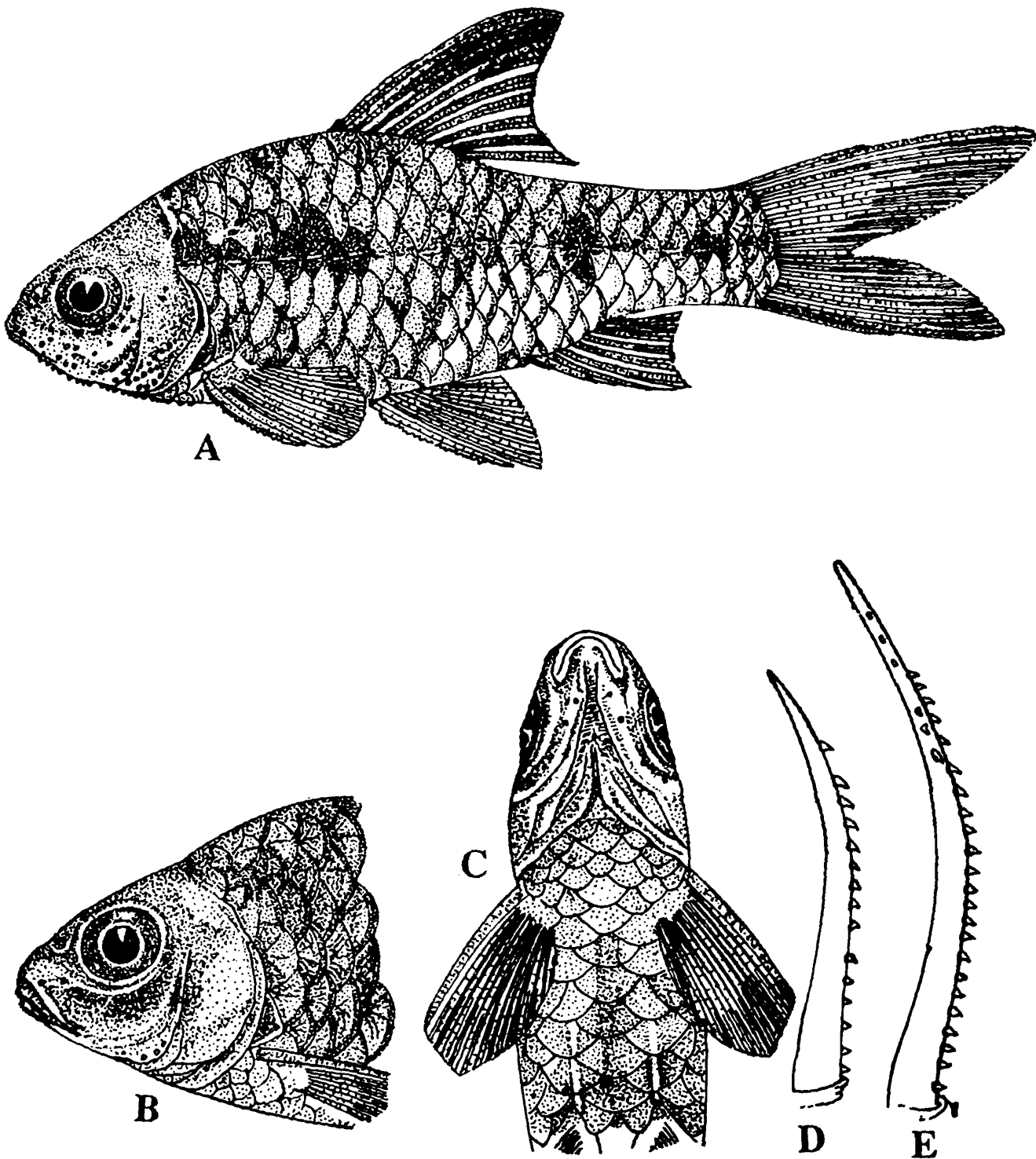
Puntius sahayadriensis Silas, *J. Bombay nat. Hist. Soc.*, 51(3), p.582, pl.1, figs. 1-6, 1950 (type locality, Yenna river, Mahabaleshwar, Satara dist., Maharashtra).- Jayaram, *Handbk. FW. Fish. India*, p.102 (distribution) p.110 (key) 1981.

Vernacular Names : NIL

Specimens Studied : NIL

Diagnosis : A deep bodied fish with seven vertical colour bands on body, no barbels,

dorsal ray weak and articulated. Lateral line complete and 10 circumpeduncular scales and $3\frac{1}{2}$ scales between LL and anal fin.



P. Sahyadriensis: A. Lateral view of male, at the time of breeding; B. Lateral view of head and anterior part of body of female; C. Ventral view of head and anterior part of body of female; D. Outer ray of pectoral fin of male, during breeding season showing the spine like tubercles; E. Outer ray of pelvic fin of male, during breeding season showing the spine like tubercles.

Description : Description after Silas, 1950.

D. III/8-9; P. 13; V. 9; A. iii, 5; C. 19; LL. 23-24.

Dorsal profile more arched than ventral. Head length 25.00 to 33.33; body depth 33.33 to 38.46 in percent of standard length. Snout short, blunt, studded with sensory pores along sides. Eyes large, visible from below ventral surface, 28.57 to 36.36 in percent of head length. Lips fleshy. No barbels.

Dorsal fin inserted nearer tip of snout than caudal fin base. Last unbranched dorsal ray feeble, articulated. Dorsal fin base greater than least height of caudal peduncle. Pectoral fins extending to pelvic fins; latter reach anal opening. Anal fin when laid flat not reaching root of caudal fin. Least height of caudal peduncle 66.67 to 100.00 in percent of its length. Lateral line complete.

Scales :	PDS 8; Pre-anal 13; Pre-pelvic	6
	Between LL and dorsal fin base	4 $\frac{1}{2}$
	Between LL and pelvic fin base	4 $\frac{1}{2}$
	Between LL and anal fin base	3 $\frac{1}{2}$
	Circumpeduncular	10

Gill Rakers : Not taken.

Size : 70 mm TL

Colour : Much variation is seen. Typical pattern is body with seven vertical dark blotches with the scales having a dark margin. In breeding season, the number and position of vertical bands may vary, besides the body becoming reddish brown throughout. The males are lighter. Secondary sexual characters seen in the male are the presence of numerous tubercles on the snout, the lower sides of the head and the skin on the outer ray of the pectoral and pelvic fins bear a row of numerous short spine like tubercles. A second row of smaller tubercles are present on the outer half of the first ray of the pelvic fin.

Distribution : INDIA: Yenna River, Mahabaleshwar, Satara district, Maharashtra.

Relationships : Very close to *P. narayani* Hora differing from it in having more colour blotches and also a northern distribution.

Remarks : The record of *P. narayani* from the Sahayadri range in north Western ghats substantiates the view that *P. sahayadriensis* is a possible variant of *narayani*; the differences being in the scale count and number of colour bands only. The holotype is not traceable.

The "*puntio*" group

This group is closely related to the *fasciatus* group which appear to have evolved from a *puntio* like ancestor, due to long isolation from the parent stock. A comparison of the species is presented in Table 20.

Species :

P. puntio (Hamilton), 1822, p.318.

P. phutunio (Hamilton), 1822, p.319.

P. gelius (Hamilton), 1822, p.320.

Common characters :

1. No barbels.
2. Lateral line scales 20 to 24.
3. PDS not more than 9.
4. LL/Dorsal not more than 5.
5. Body with one to four vertical colour bands.
6. Mostly confined to North India and Burma.

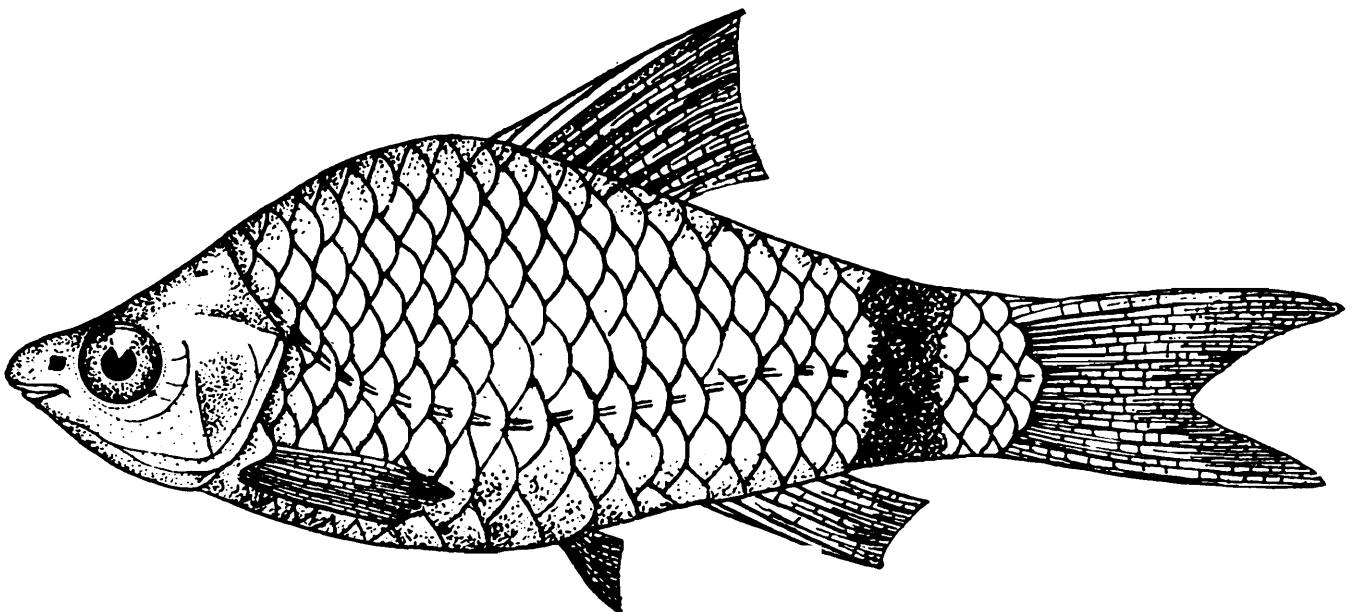
Puntius puntio (Hamilton)

Cyprinus puntio Hamilton, *Fish. Ganges*, pp. 318, 389, 1822 (type locality, ponds and ditches of Southern Bengal).

Systomus puntio, Bleeker, *Verh. Bat. Gen.*, 25, p.62, 1853.

Barbus puntio, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.145, 1868.- Day, *Proc. zool. Soc. Lond.*, p.100, 1870.- Day, *Fish. India*, p.582, pl.145, fig.6, 1878.- Day, *Fauna, Brit. India Fish.*, 1, p.334, 1889.- Hora & Mukerji, *Rec. Indian Mus.*, 36, p.369, TF.6, 1934 (Nam Mettsai stream, Kengtung State, Burma; considered *species inquirendum*, authorship ascribed to Hamilton and also Day).- Venkateswarlu & Rama Rao, *Occ. Paper zool. Surv. India*, No.87, p.14, 1986 (synonym of *P. sophore*).

Puntius puntio, Rahman, *Bangladesh. J.Sci. & Indus. Res.*, 9(3 & 4), p.202 (name only, Bangladesh, Bengali name), p.154 (key for identification), 1974.- Jayaram, *Handbk. FW. Fish. India*, p.102 (distribution), p.110 (key) 1981.



Lateral view of *P. puntio*

Vernacular Names : Punqti, Beng.

Specimens Studied : No specimen seen by me. Description after Day, 1878.

Diagnosis A deep bodied fish with a single broad vertical colour band round the tail,

no barbels, dorsal ray weakly osseous, smooth, and lateral line indistinctly complete with 23 scales.

Description : D. III, 8; P. 15; V i, 8; A. ii, 5; C. 21; LL. 23.

Dorsal profile arched. Head length 25.0, body depth 30.00 to 33.33 in percent of total length. Snout plain. Eyes large, 25.00 in percent of head length, 100.00 in percent of interorbital width and 13.33 to 20.00 of snout length. Mouth subterminal. Lips thin, plain. No barbels.

TABLE - 20
Comparison of the species of the "puntio" group

Characters	<i>P. puntio</i> (Ham), 1822, p.318	<i>P. phutunio</i> (Ham), 1822, p.319	<i>P. gelius</i> (Ham), 1822, p.320.
1. Number of Barbels	NIL	NIL	NIL
2. Last unbranched dorsal ray	Weakly osseous, smooth	Osseous, serrated	Osseous, strong, longer than LH and BD.
3. Lateral line	Complete	Incomplete after 3 or 4 scales	Incomplete after 4 to 6 scales
4. LL scales	23	20 to 23	23 or 24
5. PDS	8	7 to 9	8
6. LL/Dorsal	5	3.1/2 to 4	4 or 5
7. LL/Pelvic	2 ^{1/2}	3	3 or 4
8. LL/Anal		4 ^{1/2}	1.1/2 to 2
9. Circumpeduncular		9 or 10	6 to 8
10. Pre-anal		10 to 13	13
11. Pre-pelvic		5 or 6	6
12. Gill Rakers		0 + 9	
13. SL/LH	4.0	3.14 to 3.50	3.25 to 3.75
14. SL/Body depth	3.0 to 3.33	2.20 to 2.45	3.25 to 4.20
15. LH/Eye	4.0	2.86 to 3.50	2.00 to 3.00
16. LH/Snout		3.00 to 3.50	2.50 to 3.00
17. IOW/Eye	1.00	0.75 to 1.00	1.00 to 1.33
18. Snout/Eye	0.50 to 0.75	0.86 to 1.00	1.00 to 1.33
19. LCPD/HCPD		1.00 to 1.80	1.20 to 3.00
20. Width of Mouth		less than 1ND	less than 1ND
21. Dorsal fin base		less than HCPD	less than or equal to HCPD
22. Colour	A single wide band on tail	4 vertical colour bands	2 or 3 bands
23. Distribution	West Bengal, Burma	Wide	Orissa, West Bengal, Assam

Dorsal fin inserted near tip of snout than caudal base. Last unbranched dorsal ray weakly osseous, smooth. Pectoral fins not extending to pelvic fins; latter not reaching anal opening. Anal fin when laid flat not reaching root of caudal fin. Lateral line complete but distinct only upto a few scales but very indistinctly to caudal base.

Scales : PDS 8

Between LL and dorsal fin base 5

Between LL and pelvic fin base $2\frac{1}{2}$

Size : 75.0 mm.

Colour : Silvery, a wide black band encircles the free portion of the tail and includes the tip of the anal fin. Dorsal fin orange, tipped with black.

Distribution : INDIA : West Bengal, Bangladesh, Burma.

Relationships : Related to *P.ticto* differing from it in having a vertical colour band on body, a weak, osseous smooth dorsal spine, and a somewhat less deep body. This complex of species seems to have arisen from a *ticto*- like ancestor or have become specialised in the restricted area of its occurrence unlike *ticto* which is widely distributed.

Remarks : Venkateswarlu & Rama Rao (1986) have merged this species with *P. sophore* without justification.

***Puntius phutunio* (Hamilton)**

Cyprinus phutunio Hamilton, *Fish Ganges*, pp.319, 390, 1822 (type locality, north-eastern Bengal).- Valenciennes, *Hist. Nat.Poiss.*, 16, p.395, 1842.

Systemus leptosomus McClelland, *Asiat. Res.*, 19, pp.287, 387, pl.44, fig.2 (Bengal, Hamilton's MS drawing), 1839.

Systemus phutunio, Bleeker, *Verh. Bat. Gen.*, 25, pp.62, 128, 1853.

Barbus phutunio, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.154, 1868.- Day, *Proc. zool. Soc. Lond.*, 2, p.375, 1869.- Day, *Fish. India*, p.578, pl.145, fig.4, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.327, 1889.- Sewell & Chaudhuri, *Ind. Fish. of Prov. Util.* etc., p.15, fig.8, 1912.- Hora, *Rec. Indian Mus.*, 22, p.186, 1921.- Prashad & Mukerji, *Rec. Indian Mus.*, 31, p.201, 1929 (Myitkyina dist., Burma).- Prashad & Hora, *Rec. malaria Surv. India*, 6(4), pp.637, 641, pl.14, fig.25, 1936.- Shaw & Shebbeare, *J. Asiat. Soc. Beng.*, 3, p.39, fig.34, 1937 (R. Penchenai, N. Bengal).- Hora, Misra & Malik, *Rec. Indian Mus.*, 41(3), p.273, 1939 (comparison with *ticto*).- Hora, *Rec. Indian Mus.*, 42, p.372, 1940 (distinction from *gelius* indicated).-

Barbus (Puntius) phutunio, Hora & Mukerji, *Health Bull.*, (12), pl.6, fig.23, 1938 (larvicidal properties).- Bhuiyan, *Asiat. Soc. Pakistan*, No.13, fig. 1964 (Dacca).

Puntius phutunio, Menon, *Rec. Indian Mus.*, 52(2), p.22, 1956 (Manipur).- Karamchandani, *Tropical Ecology*, 3(1&2), p.80, 1962 (R. Ganga at Dighwara).- Motwani; *et al.*, *Trop. Ecol.* 3(1&2), p.20, 1962 (R Brahmaputra, Assam). Venkateswarlu, *Indian J. Zootomy*, 13(3), p.122, 1972 (name only, Bihar).- Tilak; *Rec. zool. Surv. India*, 67(1-4), p.95, 1973 (Goa, Colem).- Rahman, *Bangladesh J. Sci. & Indus Rec.*, 9(3 & 4), p.202 (name only, Bangladesh, Bengali name), p.154 (key for identification), 1974.- Rahiman, *Bull. FW. Fish. Res. Stn., Chandpur*, No.1, p.8, 1974 (name only, checklist, Bangladesh).- Menon, *Spl. Publ. No.1, Fish. Soc. India*, p.39, 1974 (checklist of Himalayan & Indo-Gangetic fishes).- Mirza, *Bijdr. Dierk.*, 45(2), p.172 (Indus plain).- Chattopadhyay, *Rec. zool. Surv. India*, 68(1-4), p.356, 1975 (Berli Beliaghata, Calcutta).- Sen, *Seafood Export J.*, 10(1), p.3, 1978 (Assam, local and english name).- Singh, *Rec. zool. Surv. India*, 71, p.124, 1976 (Jharai river, Siripur, Bihar).- Jayaram & Singh, *Rec. zool. Surv. India*, 72, p.252, 1977 (River Attrai, N. Bengal).- Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*, 9(1), p.52 1979 (name only, list of Ganga fishes).- Mirza, *Proc. Ist. Pakistan Congr. Zool.*, p.16, 1980 (checklist, distribution in Pakistan & Azad Kashmir).- Srivastava, *Fishes of UP & Bihar*, p.66, fig.46, 1980 (key, description).- Jayaram, *Handbk. FW. Fish India*, p.102 (distribution), p.109 (key), 1981.- Sen, *Occ. Paper zool. Surv. India*, No.64, p.80, 1985 (Assam).

Vernacular Names : Kudji-kerundi, Ori; Phutani pungti Beng.

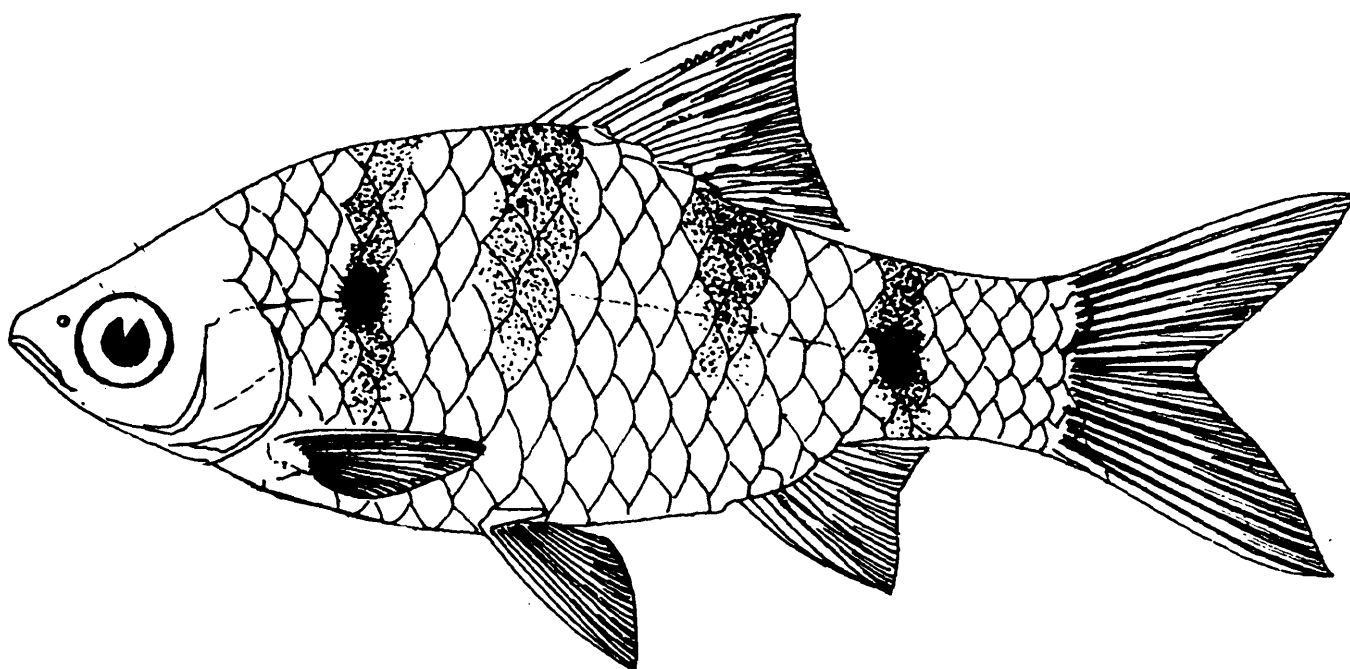
Specimens Studied : ZSI, F.2120/2, 3 exs., 21.00 to 22.00 mm SL, Darrang, Assam. ZSI, F.2518/2, 2 exs., 38.0 to 38.5 mm SL, Medha, Satara dist., S.P. Agharkar coll.

Diagnosis : A deep bodied fish without any barbels, four vertical colour bands on body, dorsal ray osseous, serrated, and lateral line incomplete ceasing after 3 or 4 scales.

Description : D. II-III, 8; P. 15; V i, 8; A. iii, 5; C. 19; LL. 20-23.

Dorsal and ventral profiles steeply arched equally. Head short, conical. Head length 25.00 to 31.82, body depth 34.21 to 45.45 in percent of standard length. Head width 33.33 to 60.00 height of head at occiput 84.61 to 100.00, snout 28.57 to 33.33 in percent of head length. Snout conical, plain. Eyes large, superior 28.57 to 35.00 in percent of head length, 75.00 to 133.00 in percent of interorbital width, 100.00 to 116.67 snout length. Mouth terminal, its width less than inter-nostril distance. Lips thin, plain. No barbels.

Dorsal fin inserted midway between tip of snout and caudal base, occasionally nearer snout. Last unbranched dorsal ray osseous, serrated, serrations becoming indistinct in the adult. Dorsal fin base greater than least depth of caudal peduncle. Pectoral fins just extend to pelvic fins; latter not reaching and opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 55.56 to 100.00 in percent of its length. Lateral line incomplete, ceasing after 3 or 4 scales.



Lateral view of *P. phutunio*

Scales :	PDS 7 to 9; Pre-anal 10-13; Pre-pelvic 5 or 6
	Between LL and dorsal fin base $3\frac{1}{2}$ -4
	Between LL and pelvic fin base 3
	Between LL and anal fin base $4\frac{1}{2}$
	Circumpeduncular 9 or 10

Gill Rakers : 0 + 9

Size : 70 mm TL

Colour : Reddish-brown, with a black band passing from back to opposite middle of pectoral fin, a second from below dorsal spine to below lateral line, a third from posterior end of dorsal fin to below lateral and a fourth across the caudal peduncle, slightly posterior to end of anal fin. The first and the last bands may have a black dot in the middle over the lateral line. Body diaphnous.

As per Day (1889) adults become very similar to *P. punctatus*, the pectoral band decreasing in size, whilst the second band breaking up into spots.

Distribution : INDIA:..Goa, Bihar, Orissa, West Bengal, Assam, Tripura. Burma, Bangladesh, Pakistan.

Relationships : Related to *P. gelius* differing from it in scale counts and mainly in colouration, in having greater number of bands (four vs. two)

Additional Data :

SL/Pre dorsal	52.38 to 59.03	N=5
SL/Pre anal	69.74 to 75.00	N=5
SL/Pre pelvic	44.15 to 59.09	N=4
LH/LCPD	57.14 to 58.33	N=4
LH/HCPD	50.00 to 57.14	N=5
LH/Dorsal fin base	57.14 to 69.23	N=5
LH/Mouath width	21.00 to 28.57	N=4

Puntius gelius (Hamilton)

Cyprinus gelius Hamilton, *Fish. Ganges*, pp.320, 390, pl.145, fig.3, 1822 (type locality, north-east parts of Bengal).- Valenciennes, *Hist. Nat. Poiss.*, 16, pp.396, 397, 1842.

Cyprinus canius Hamilton, *Fish. Ganges*, pp.320, 390, 1822 (type locality, north-east parts of Bengal).

Systemus gelius, McClelland, *Asiat. Res.*, 19, pp.286, 386, pl.44, fig.4, 1839 (Bengal, Hamilton's MS drawing).- Bleeker, *Verh. Bat. Gen.*, 25, p.129, 1853.

Systemus canis McClelland, *Asiat. Res.*, 19, pp.287, 387, pl.44, fig.6, 18, 1839 (Bengal, Hamilton's MS drawings).- Bleeker, *Verh. Bat. Gen.*, 25, p.129, 1853.

Barbus gelius, Gunther, *Cat. Fish. Brit. Mus.*, 7, p.154, 1868.- Day, *Proc. zool. Soc. Lond.*, p.374, 1869.- Day, *Fish. India*, p.577, pl.145, fig.3, 1878.- Day, *Fauna Brit. India, Fish.*, 1, p.327, 1889.- Hora, *Curr. Sci.*, 1(12), p.385, 1933 (Surjyapur canal, Uttarbagh, W. Bengal).- Hora, Misra, Malik, *Rec. Indian Mus.*, 41, p.273, 1939 (comparision with *ticto* group of species).- Hora, *Rec. Indian Mus.*, 42, p.372, Text. fig.1, 1940 (Mahanadi near Sihawa, M.P.)

Barbus (Puntius) gelius, Hora, *Rec. Indian Mus.*, 42, p.367 (Sihawa), p.369 (Mahanadi at Dhamtari Bazar), p.372, Text. fig.1, 1940 (M.P.).- Job, David & Das, *Indian J. Fish.*, 2(1), p.32, 1955 (Mahanadi below Hirakud Dam).

Puntius gelius, Pant, *Rec. zool. Surv. India*, 64(1-4), p.87, 1970 (Almora, Kumaon dist.).- Menon *et al.*, *Sci. & cult.*, 38, p.341, 1972 (Hoogly river, Pulta stretch).- Venkateswarlu, *Indian J. Zootomy*, 13(3), p.122, 1972

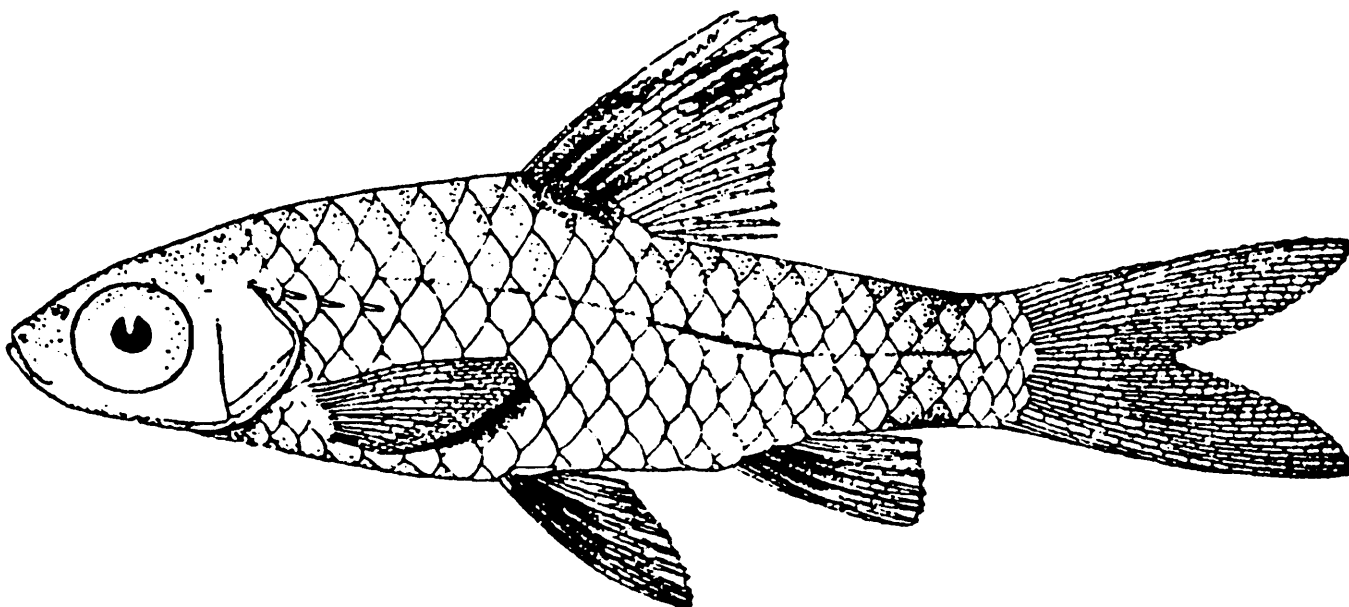
(name only, Bihar).- Mirza, *Biologia*, 20(1), p.79, 1974 (name only, Indus plain and adjoining hills).- Rahman, *Bangladesh J. Sci. & Indus Rec.*, 9(3 & 4), p.201 (name only, Bangladesh, Bengali name), p.154 (Key for identification) 1974.- Rahman, *Bull. FW. Fish. Res. Stn. Chandpur*, No. 1, p.8, 1974 (name only, checklist, Bangladesh).- Menon, *Spl. Publ. No.1, Int. Fish. Soc. India*, p.39, 1974 (checklist of Himalayan & Indoganggetic fishes, - Chattopadhyay, *Rec. zool. Surv. India*, 68(1-4), p.356, 1975 (Beliaghata Beri).- Mirza, *Bijdr. Dierk.*, 45(2), p.172, 1975 (Indus plain).- Singh, *Rec. zool. Surv. India*, 71(1-4), p.124, 1976 (Jharia river, N. Bihar).- Jayaram & Majumdar *Rec. zool. Surv. India*, 69, p.313, Ramsagar tank, Sambalpur, Orissa, Sen, *Seafood Export J.*, 10(1), p.2, 1978 (Assam, local and English names).- Venkateswarlu & Menon, *Acta Ichthyol. Piscatoria*, 9(1), p.52, 1979 (name only, list of Ganga fishes).- Mirza, *Proc. Ist. Pakistan Cong. Zool.*, p.16, 1980 (checklist, distribution in Pakistan & Azad Kashmir).- Jayaram, *Handbk. FW. Fish. India*, p.100 (distribution), p.109 (key), 1981.- Mirza & Abdussamad, *Biologia*, 28(1), p.73, 1982 (description, Pakistan).- Venkateswarlu, *Occ. Paper zool. Surv. India*, No.56, p.37, 1984 (common & vernacular names).- Sen, *Occ. Paper zool. Surv. India*, No.64, p.84, 1985 (Assam).

Vernacular Names : Putthi, Ass; Gilipungti, Beng; Cutturpoh, Ori.

Specimens Studied : ZSI, F.13073/1, 1 ex., 20 mm SL., Dhamtari Bazaar, Mahanadi. Data of Mirza & Abdussamad, 1982 included.

Diagnosis : A small elongated fish with 2 vertical bands on tail, no barbels, dorsal ray osseous, strong, long, longer than body depth and head length, serrated and lateral line with 23 or 24 scales incomplete, creasing after 4 to 6 scales.

Description : D. II, 8; P. 14-15; V i, 8; A. iii, 5; C. 19; LL. 23-24.



Lateral view of *P. gelius*

Dorsal and ventral profiles arched equally with a gentle rise. Head small, blunt. Head length 26.67 to 30.77, body depth 23.81 to 30.77, in percent of standard length. Head width 38.46 to 75.19, height of head at occiput 66.67 to 100.00, snout 33.33 to 40.00 in percent of head length. Snout plain, bluntly pointed. Eyes moderate, 33.33 to 50.00 in percent of head length, 75.19 to 100.00 in percent of interorbital width and also of snout length. Mouth antero-superior, slightly arched, its width less than inter-nostril distance. Upper lip reflected slightly. No barbels.

Dorsal fin inserted equidistant between tip of snout and caudal base. Last unbranched dorsal ray ossified into a strong, long serrated spine with 10 to 16 serrations on its inner edge, its length greater than body depth and head length. Dorsal fin base less than least depth of caudal peduncle. Pectoral fins not extending to pelvic fins; latter may or may not reach anal opening. Anal fin when laid flat not reaching root of caudal fin. Least depth of caudal peduncle 33.33 to 77.78 in percent of its length. Lateral line incomplete after 4 to 6 scales from anterior.

<i>Scales</i> :	PDS 8; Pre pelvic 6; Pre anal 13	
	Between LL and dorsal fin base	4 or 5
	Between LL and pelvic fin base	3 or 4
	Between LL and anal fin base	1½ or 2
	Circumpeduncular	6 to 8

Gill Rakers : Not taken

Size : 50 mm TL

Colour : Camel brown on all sides, a black band over the caudal fin a little anterior to base, another less distinct band close to the base of the caudal; a silver band on each side; a black spot across the dorsal spine. A black band over base of anal, occiput also black.

Distribution : INDIA : M.P., U. P., Orissa, West Bengal, Assam.

Remarks : Found in ponds and ditches.

Relationships : Related to *P. puntio* differing from it in having the dorsal spine serrated and in colouration.

Additional Data : (N = 1)

SL/Pre dorsal	50.00
SL/Pre anal	70.00
SL/Pre pelvic	40.00
LH/LCPD	75.00
LH/HCPD	58.34
LH/Dorsal fin base	50.00
LH/Width of Mouth	25.00

SPECIES OF "BARBUS" OUTSIDE INDIAN REGION BUT REFERRED TO INDIAN LITERATURE

<i>Barbus altus</i>	Thailand, Cochin, China	Hora 209* :402-404
<i>B. brachycephalus</i>	Afganisthan	Hora 110:706
<i>B. caldwelli</i>	China	Hora 223:306, 308
<i>B. canus</i>		Hora 395:128
<i>B. capito conocephalus</i>	Afganisthan	Hora 110:706 133:795
<i>B. capito conocephalus</i>	Issykkuli	
<i>Schizothorax</i>	Afganisthan	Hora 133:795
<i>pseudatsaiensis</i>		
<i>B. capito conocephalus</i>	Afganisthan	Hora 133:735, 795
<i>Schizothorax sp.</i>		
<i>B. coggini</i>	Yunnan	Hora 129:36
<i>B. deauratus</i>	Thailand	Hora 25:155
<i>B. grahmi</i>	Yunnan	Hora 129:364
<i>B. gregorii</i>	Yunnan	Hora 129:364
<i>B. luteus</i>	Iraq	Hora 260:4
<i>B. margaritanus</i>	Yunnan	Hora 129:364
<i>B. microlepis</i>	Afganisthan	Hora 110:705
<i>B. normani</i> Tchang	Yunnan	Hora 171:244
<i>B. sorroides</i> Duncker	sumatra, Malaya	Hora 223:p.306 <i>A. hexagonolepis</i>
<i>B. yunnanensis</i>	Yunnan	Hora 129:364
<i>B. (Labeobarbus)</i>		
<i>tambroides</i>	Thailand	Hora 33:471
<i>B. (Puntius) brevis</i>	Thailand	Hora 25: 156
<i>B. (Puntius) bulu</i>	Thailand	Hora 33: 470
<i>B. (Puntius) javanicus</i>	Thailand	Hora 25:155,436:14, 19
<i>B. (Puntius) luteus</i>	Iraq	Hora 260:4,577
<i>B. (Puntius)</i>		
<i>schwanfieldi</i>	Thailand	Hora 25:156
<i>B. (Puntius) smith</i>		
<i>B. (Puntius) sumatranus</i>	Thailand	Hora 33:470
<i>Puntius belinka</i>	Sumatra, Java	Hora 436:13,49
<i>Puntius nini</i>	Thailand	Hora 25:156
<i>Puntius orphoides</i>	Thailand, Malaya, Indonesia, Kumpuchea	hora 436: 14
<i>Puntius schwanfieldi</i>	Thailand, Vietnam, Malaya, Kumpuchea, Indonesia	Hora 25:156

* Numbers indicate serial number of papers of Hora listed by Jayaram, 1976 in *Index Horana*.

**SYSTEMATIC POSITION OF SPECIES OF
BARBUS/PUNTIUS NOT DEALT WITH IN THIS MONOGRAPH**

ambassis, Barbus	= P.guganio
anandalei, Barbus	= P.sophore
apogonoides, Systemus	= P.apogon
arulus, Barbus	= P.fasciatus
assimilis, Systemus	= P.filamentosus
binduchitra, Barbus	= P.sarana orphoides
binotatus, Leuciscus of Blyth	= P.dorsalis
blythii, Barbus	= Neolissochilus blythii
canarensis, Gobio	= P.curmuca
caudimarginatus, Barbus	= P.sarana orphoides
canis, Systemus	= P.gelius
canius, Cyprinus	= P.gelius
carletoni, Barbus	= P.sophore
chagunio, Cyprinus	= Chagunius chagunio
chilinoidea, Barbus	= Tor chilinoidea
chrysomus, Systemus	= P.sarana sarana
chrysopoma, Puntius	= P.sarana spilurus
chrysopomus, Barbus	= P.sarana subnastus
chrysopterus, Barbus	= P.sophore
clavatus burtoni, Puntius	= Poropuntius clavatus
clavatus clavatus, Barbus	= Poropuntius clavatus
coggini, Barbus	= poropuntius coggini
compressus, Barbus	= Neolissoochilus compressus
conirostris, Barbus	= P.micropogon
curmuca, Cyprinus	= Tor curmuca
deliciosus, Barbus	= P.sarana sarana
dobsoni, Barbus	= P.jerdoni
dukai, Barbus	= Neolissochilus dukai
duvacelli, Barbus	= P.sarana sarana
duvacelli, Leuciscus	= P.sophore
gardonoides, Barbus	= P.sarana sarana
gibbosus, Barbus	= P.sarana subnasutus
gibbosus, Systemus	= P.terio
goniosoma, Puntius	= P.binotatus
graiyi, Barbus	= P.fasciatus
gracilis, Barbus	= P.micropogon
guentheri, Barbus	= P.kolus

hamiltoni, Puntius	= P.amphibius
hampal, Barbus	= Tor macrolepidotus
hexagonolepis, Barbus	= Neolissochilus hexagonolepis
hexastichus, Barbus	= Neolissochilus hexastichus
himalayanus, Barbus	= Tor chilinoides
immaculatus, Systemus of Blyth	= P.chola
immaculatus, Systemus of Mc Clelland	= P.sarana sarana
innominatus, Leuciscus	= Neolissochilus innominatus
innominatus, Barbus	= P.sarana spilurus
jerdoni maciveri, Barbus	= P.jerdoni
kakus, Barbus	= P.sarana sarana
khudree, Barbus	= Tor khudree
layardi, Barbus	= P.dorsalis
lepidus, Puntius (Copoeta)	= P.filamentosus
leptosmus, Systemus	= P.phutunio
liacanthus, Barbus	= P.chola
longispinis, Barbus	= Tor hexastichus
macrolepidota, Copoeta of Blyth	= Neolissochilus blythii
macrolepidota, Copoeta of Val.	= Tor macrolepidota
macularis, Systemus	= P.apogon
macularius, Barbus	= P.apogon
madraspatensis, Systemus	= P.filamentosus
mahecol, Leusciscus	= P.filamentosus
malabaricus, Barbus	= Neolissochilus stracheyi
not of Jerdon & Day	
margarianus, Barbus	= Poropuntius margarianus
McClellandi, Barbus	= P.ticto stoliczkanus
melanampyx, Labeo of Day	= P.fasciatus
modestus, Puntius	= P.sophore
mosal, Cyprinus	= Tor mosal
mussullah, Barbus	= Tor mussullah
myitkyinae, Barbus	= Poropuntius myitkyinae
mysorensis, Barbus	= P.micropogon
neilli, Barbus	= Tor neilli
nigrovittatus, Barbus	= Neolissochilus nigrovittatus
oatesii, Barbus	= Poropuntius oatesii
perlee, Barbus	= P.parrah
pinnauratus	= P.sarana subnasutus
polidori, Barbus	= P.sarana sarana
puckelli, barbus	= P.dorsalis

pulchellus, Barbus	= P.jerdoni
progenius, barbus	= Tor progenius
putitora, Cyprinus	= Tor putitora
pyrropterus, Systemus	= P.conchonius
rubripinna, Systemus	= P.sarana orphoides
rubripinnis, Barbus	= P.sarana orphoides
saberi, Puntius	= P.sarana sarana
schanicus, Barbus	= Poropuntius schanicus
sewelli, Barbus	= P.sarana orphoides
shanensis, Barbus	= Poropuntius schanicus
sophore, Puntius of Kner	= P.vittatus
sophoroides, Barbus	= P.chola
spinulosis, Barbus	= Neolissochilus spinulosis
stedmanensis, Barbus	= Neolissochilus compressus
stigma, Barbus	= P.sophore
stigma, Leuciscus	= P.sophore
stevensonii, Barbus	= Neolissochilus stevensonii
stracheyi, Barbus	= Neolissochilus stracheyi
sulphureus, Leuciscus	= P.sophore
tetrapagus, Systemus	= P.chola
tetrapilus, Barbus	= P.dorsalis
thermalis, Barbus of Gunther	= P.chola
tictis, Barbus	= P.ticto ticto
tictis, Cyprinus	= P.chola
timbiri, Puntius	= P.sarana spilurus
titius, Barbus	= P.chola
tor, Cyprinus	= Tor tor
tor, Labeobarbus	= Neolissochilus hexastichus
tristis, Systemus	= P. dorsalis
unimaculatus, Systemus	= P.chola
wynaadensis, Barbus	= Neolissochilus wynaadensis
* Not seen in original	

REFERENCES

- Ahmad, N. 1943. Fauna of Lahore. 5. Fishes of Lahore. *Bull. Dept. Zool. Univ. Punjab*, 1 : 253-374.
- Banarescu, P. 1868. Recent advances in Teleost taxonomy and their implications on freshwater zoogeography. - *Rev. Roum. Biol. Zool. Ser.*, 13(3) : 153-160.
- Bleeker, P. 1836. Systema Cyprinoideorum revisum. *Nederlandisch Tijdschr. Dierk.*, 1 : 187-218.
- Bleeker, P. 1863. Atlas Ichthyologique des Indes orientales Neerlandaises public sous les auspices du Government Colonial Neerlandais. 3, Cyprins, pls: 102-144.
- *Bleeker, P. 1864. Description de quelques especes de Cobitoides et de Cyprinoides de Ceylon. *Nat. verh. Holl. Maatsch. Westensch*, 2, verz., 20, p. 12, pl.4, fig.4.
- Chacko, P.I., Kuriyan, G.K., & Thyagarajan, S. 1954. A survey of the fisheries of the Cauvery river. *Contr. Freshw. fish Biol. Stn., Madras*, 12 : 1-19.
- Cuiver, G. & Valenciennes, M.A. 1842. *Histoire naturelle des poissons*. Paris, 16, 17 (1844).
- Das, K. N. 1939. On a collection of fish from the Hazaribagh district Bihar. *Rec. Indian Mus.*, 41(4): 437-450.
- Datta, A.K. & Karmakar, A.K. 1981. A new species of *Puntius* (Family) Cyprinidae from Bastar District, Madhya Pradesh. *Bull. zool. Sur. India*, 3(3): 179-184.
- Datta Munshi, J. S. & Srivastava, M.P. 1988. *Natural History of fishes and systematics of freshwater fishes of India*, Delhi, i-xvii + 403 pp, 40 pls.
- Day, F. 1865. *The fishes of Malbar* .- London, Qyaritch, 293 pp.
- Day, F. 1868, On some new fishes from Madras. *Proc. zool. Soc. Lond.* : 192-199.
- Day, F. 1876-1878. *The fishes of India; being a natural history of the fishes known to inhabit the seas and freshwaters of India, Burma and Ceylon*, London. 1-xx, 1-778, pp., 195 pls.
- Day, F. 1889. *The Fauna of British India, including Ceylon and Burma*, Fishes, 1, 548 pp., London, Taylor & Francis.
- Deraniyagala, P.E.P. 1930. The Eventognathi of Ceylon. *Spolia zeylanica*, 16(1): 1 - 41, 6 pls.
- De Witt, H. 1960. A contribution to the ichthyology of Nepal. *Stanford Ichthyol. Bull.* 7(4) : 63 - 88.
- Greenwood, P. H. & Rosen, D. E. & Weitzman, S. H., Myers, G.S. 1966. Phyletic studies of teleostean fishes, with a provisional classification of living forms. *Bull. Amer. Mus. nat. Hist.*, 131, (4): 339 - 456.

* Not seen in original

- Gunther, A. 1868. Catalogue of the fishes in the British Museum. 7, xx + 512 pp.
- Hamilton, F. (Formerly Buchanan). 1822. *An account of the fishes found in the River Ganges and its branches*. Edinburgh, viii + 405 pp., 39 pls.
- Hora, S. L. 1928. Notes on fishes in the Indian Museum, XV Notes on Burmese fishes. *Rec. Indian Mus.*, 30(1) : 37 - 40.
- Hora, S.L. 1936. Notes on a small collection of fish from the Chitaldrug district, Mysore. *Rec. Indian Mus.*, 38(1) : 1 - 7.
- Hora, S.L. 1937. Notes on fishes in the Indian Museum. XXXI. On a small collection of fish from Sandoway, Lower Burma. *Rec. Indian Mus.*, 39(4): 323 - 331
- Hora, S.L. 1940. On a collection of fish from the headwaters of the Mahanadi river, Raipur district, C.P. *Rec. Indian Mus.*, 42(2): 365 - 374.
- Hora, S.L. 1942. A list of fishes of the Mysore state and of the neighbouring hill ranges of the Nilgiris, Wynaad and Coorg. *Rec. Indian Mus.*, 44(2): 193 - 200.
- Hora, S.L. & Law, N.C. 1941. The fresh water fish of Travancore.- *Rec. Indian Mus.*, 43(2): 233-256, 1 pl.
- Hora, S.L. & Misra, K.S. 1938. Fish of Dec lali. III. On two new species and notes on some other forms. *J. Bombay nat. Hist. Soc.*, 40(1): 20 - 38, 3 pl.
- Hora, S.L. & Misra, K.S. 1942. Fish of Poona. Part II. *J. Bombay nat. Hist. Soc.*, 43 (2): 218 - 225.
- Hora, S.L., Misra, K.S. & Malik, G.M. 1939. A study of variations on *Barbus (Puntius) ticto* (Ham.).- *Rec. Indian Mus.*, 41(3): 263 - 279.
- Hora, S.L. & Nair, K.K. 1941. Fishes of the Satpura range, Hoshangabad district, Central provinces. *Rec. Indian Mus.*, 43(3): 361 - 373.
- Jayaram, K.C. 1976. Index Horana.- *Occ. Papers. Zool. Surv. India*, No.1, 190 pp.
- Jayaram, K.C. 1981. *The freshwater fishes of India, Pakistan, Bangladesh, Burma and Sri Lanka*.- A Handbook, Calcutta, *Zool. Surv. India*, 475 pp., 13 pls.
- Jayaram, K.C., Venkateswarlu, T.V. & Rangunathan, M.B. 1982. A survey of the Cauvery river system with a major account of its fish fauna. *Occ. Papers zool. Surv. India*, No.36, 115 pp, 12 pls.
- Jordon, D.S. 1923. A classification of fishes including families and genera as far as known. *Stanford Univ. Publ. Univ. Ser., Biol. Sci.*, 2(3): 79 - 243.
- Magtoon, W. & Ara, R. 1939. Karyotypes of five *Puntius* species and one *Cyclohelichthys* species (Pisces, Cyprinidae) from Thailand. *Bull. Nat. Sci. Mus.*, (a), 15(3), pp. 167 - 175.
- Menon, A.G.K. 1963. Subspecies of the Cyprinid fish *Puntius sarana* (Ham.) with description of *P. s.spilurus* (Gunther) from Ceylon. *Spolia zeylanica*, 30(1): 65-70.

- Menon, A.G.K. 1967. Taxonomy of *Puntius filamentous* (Valenciennes) a Cyprinid fish of South India and Ceylon. *Ichthyologica*, July - Dec., : 147 - 153.
- Mirza, M.R. 1971. A note on the status of *Systemus chrysopterus* McClelland, 1839 (Pisces, Cyprinidae). *Biologia*, 17(1) : 49 - 59.
- Mirza, M.R. & Abdussamad, D. 1982. A contribution to the fishes of the genus *Puntius* Hamilton, 1822 (Pisces, Cyprinidae) from Pakistan. *Biologia*, 28(1): 61 - 81.
- Mirza, M.R. & Janjua, M.H. 1984. Fishes of Muzaffarabad, Azad Kashmir.- *Biologia*, 30(2): 229 - 244.
- Misra, K.S. 1938. On a collection of fish from the eastern ghats. *Rec. Indian Mus.*, 40: 255 - 264.
- Misra, K.S. 1962. An aid to the identification of common commercial fishes of India and Pakistan. *Rec. Indian Mus.*, 57(1 4) (1959): 1-320.
- Mukerji, D.D. 1932. On a small collection of fish from the Bhavani river (S. India).- *J. Bombay nat. Hist. Soc.*, 35 : 163.
- Munore, Iran, S.R. 1955. *The Marine and freshwater fishes of Ceylon*.- Canberra, i-xvi + 349 pp., 56 pls., 19 figs.
- Murty, V Sriramachandra 1977. Taxonomic studies on the fishes of the family Cyprinidae from Lake Kolleru, Andhra Pradesh. *Proc. Indian Acad. Sci.* 85(b): 107 - 146.
- Myers, G.S. 1960. Preface to any future classification of the Cyprinid fishes of the genus *Barbus*. *Stanford Ichtyol. Bull.* 7(4) : 212 - 215.
- Pillay, T.V.R. 1951. A morphometric and biometric study of the systematics of certain allied species of the genus *Barbus* Cuv. & Val. *Proc. nat. Sci. India*, 17(5): 331 - 348.
- Raj, B.S. 1916. Notes on the freshwater fish of Madras. *Rec. Indian Mus.*, 12, pp. 249 - 295 : 25 - 29.
- Rajan, S. 1955. On a collection of fish from the head waters of the Bhavani river, South India., *J. Bombay nat. Hist. Soc.*, 53(1) : 44 - 48.
- Regan, C.T. 1911. The classification of the Teleostean fishes of the Order Ostariophysi. 1. Cyprinoidea. *Ann. Mag. nat. Hist.* 8(8) : 13 - 32.
- Selvaraj, C., & Abraham, M. 1988. Review of the taxonomic status of *Puntius mahecola* (Valenciennes). *Matsya*, 12 & 13 (1986-87): 20 25.
- Senanayake, F. Ranil. 1982. *Barbus srilankensis*, a new species of Cyprinid fish from Sri Lanka.- *Ceylon J. Sci., Biol. Sci.*, 15 (1 & 2) : 165 - 172, 1 pl
- Shaw, G.E. & Sheebbeare, E.O. 1937. The fishes of Northern Bengal. *J. roy. Asiat. Soc. Bengal, Science*, 137 pp, 6 pls.