

## PUNTIUS ORNATUS FROM THE BRAHMAPUTRA DRAINAGE IN ASSAM

Sabitry Bordoloi and Anjali Baishya

Resource Management and Environment Division, Institute of Advanced Study in Science and Technology, Vigyan Path, Paschim Boragaon, Guwahati, Assam 781035, India  
*web supplement*

Survey of fish fauna in component beels of Gorjan area, Hajo (26°5'N & 91°32'E), Kamrup district, Assam is being carried out since 2003. Gorjan beel has an area of 545ha and comprises of thirty three component beels. During our surveys we have documented fishes belonging to 20 different families. A fish of the genus *Puntius* Hamilton-Buchanan, 1822 was recorded from most of these beels. On comparison it was found to resemble *Puntius ornatus* a new species described by Vishwanath and Laisram (2004) from Lokchao river, Moreh locality of Manipur. Sinha (1994) recorded 12 species of the genus *Puntius* from northeastern region of India. Sarma *et al.* (2004) recorded seven species of fishes of the genus *Puntius* from the Brahmaputra valley zone. The species *Puntius ornatus* is a new record for the Brahmaputra drainage. The distributional range of the fish extends to Kamrup district of Assam from Moreh in Manipur.

The population of *Puntius ornatus* was monitored for a year and it was found that the species occurs rarely, in small numbers, and forms a small percentage on the small-sized range group (less than 10cm) of fishes captured by various devices. The fish could be collected throughout the year; normally captured along with other fishes collected in *Darki* a device made of bamboo and nylon rope. *Darki* is 33in long, 6in broad and 17-18in high. Generally, small-sized fishes such as *Chanda nama*, *P. ranga*, *B. dario*, prawns etc. are captured in a *darki*.

When the water is deep *darkis* are placed and the small size group fishes enter the device along with water. When water depth reduces during winter these fishes are caught in the *Mahari jal* that are placed across the channel connecting the river Brahmaputra.

*P. ornatus* fishes were brought to the laboratory, sometimes alive. Fishes were preserved in 6% formaldehyde solution and measurements were taken with dial vernier calliper to the nearest third decimal. The fish lose their bright colour in formaldehyde solution. Detailed morphological description as per (Jayaram, 1999) is provided for 20 male and 20 female fishes collected for over a period of one year. Measurements are given in percent standard length and standard length is given in mm. Sexual dimorphism was studied and measurements of male and female fishes were compared using Mann Whitney U test (Table 2).

The specimens were deposited in the Biodiversity Museum of IASST (Reg. nos. - female fishes IASST F69-88 and male fishes IASST F 89-108). Photographs were taken in living condition in breeding season (Image 1<sup>w</sup>) and pre-breeding season (Image 2<sup>w</sup>).

Detailed morphological description is in conformity with the description given in Vishwanath and Laisram (2004). D.iii,8; p.i,II; V.i,8; A.iii,5; C 9+8. Predorsal scale 8-9; pre-pelvic scale 10; pre-anal scale 18; scales from dorsal fin to lateral line three; scales from lateral line to pelvic base four; circum peduncular scale 10-11; lateral line is incomplete; scales on lateral line series are 23-24.

**Sexual dimorphism:** The fish exhibits clear sexual dimorphism. Male is bright reddish-orange in colour whereas the female is yellow in colour though the fins are orange. Colouration in the breeding season is very bright and males and females can be easily distinguished. In prebreeding season the orange colour of the body is not seen and the dorsal fin acquires slight yellow orange colour (Image 2<sup>w</sup>). All the fins in case of the male are reddish-orange. In case of the female the dorsal fin is deep orange (Image 1<sup>w</sup>) except for the last unbranched osseous ray. Pectoral pelvic and caudal fins are yellowish in the female. Live colouration shows some black spots but on preservation only caudal band retains the black colour. One incomplete band visible from base of dorsal fin and extends down to 3-4 scales; this mark is lost on preservation. The dark band of caudal peduncle is from 18<sup>th</sup> to 20<sup>th</sup> scale of lateral line series. The thin band at the base of caudal fin is restricted to fin region only. In formaldehyde preserved fish the black mark in the origin of pelvic fin, dorsal fin and anal fin are retained. The scales above the lateral line and two scales below the lateral line are black edged. The outer margin of eye ball becomes reddish-orange both in male and female during breeding season. This character is encountered in many different species of *Puntius*. Operculum is reddish-orange in both sexes during breeding season.

There are minor structural variations in both the sexes. Total length of male is 33.65-42.85mm whereas it ranges from 31.3-43.45mm in female. Standard length of male ranges from 28.00-33.15mm and that of the female ranges from 24.3-35.00mm.

Ichthyofaunal diversity of the Brahmaputra drainage represents fishes of the Indo-Gangetic plains, eastern Himalayan fauna, Burmese fauna and indigenous fauna (Ghosh & Lipton, 1982). *Puntius ornatus* was first reported from Manipur (Vishwanath & Laisram, 2004). Recording of the fish from Hajo, Kamrup district Assam extends the distributional range of the species from Lokchao river, Moreh locality of Manipur to the north bank of the Brahmaputra in the Hajo area of Kamrup district, Assam. The fish resembles the *Puntius ornatus* described from Manipur. However, the large sample size measured (n = 40) in the present study might contribute to the minor variations in measurements. The comparison of measurements of male and female fish using Mann Whitney U test reveals that the male and female differ only in three characters, viz., body width, inter orbital space and the length of caudal peduncle of the female fish measures more than that of the male fish. The female fish was always found to be slightly bigger than the male fish. The test reveals that the male and female fishes have no difference in all other characters. The fish in Manipur was collected from the river (lotic ecosystem), while the present collection was made from beels (lentic eco system). It can be inferred that the fish can

<sup>w</sup> See Image 1 & 2 in the web supplement at [www.zoosprint.org](http://www.zoosprint.org)

**Table 1. Morphometric data of male and female *Puntius ornatus* in %SL except SL given in mm**

	Maximum	Female Minimum	Average	Maximum	Male Minimum	Average
SL	35	24.3	29.332	33.15	28	30.84
Body depth	37.143	31.3106	34.227	34.22371	29.78	32
Body width	10.185	6.44135	8.3133	9.016393	5.997	7.507
Head depth	22.266	15.2439	18.755	20.68376	15	17.84
Head length	30.263	24.7133	27.488	30.71786	25.96	28.34
Head width	13.58	10.061	11.821	13.12	9.639	11.38
Eye diameter	11.585	8.28571	9.9355	12.96	8.9	10.93
Snout length	7.1174	5.96421	6.5408	7.390649	5.47	6.43
Inter orbital space	6.3988	3.96341	5.1811	7.09571	4.647	5.871
Pre dorsal length	57.222	47.5285	52.375	56.41026	49.36	52.89
Post dorsal length	40.506	31.6794	36.093	40.84507	33.85	37.35
Pre pelvic distance	55.268	42.5856	48.927	51.11876	46.52	48.82
L.Dorsal fin	34.362	22.1519	28.257	28.05281	24.1	26.08
L.Base soft dorsal fin	16.964	12.5673	14.766	15.56544	10.24	12.9
L.Base anal fin	11	7.71372	9.3569	11.43583	6.885	9.161
L.Pectoral fin	27.256	16.1392	21.697	21.60102	16.64	19.12
L.Pelvic fin	23.857	15.2215	19.539	18.31683	15.7	17.01
Depth caudal peduncle	15.302	11.128	13.215	13.65079	11.52	12.59
L. Caudal peduncle	27.877	21.1731	24.525	26.21359	21.95	24.08

**Table 2. Measurement of males and females are statistically compared using Mann Whitney U test**

Measurements	Mean	s.d	min	max	Mean	s.d	min	max	U	Z=(U-i)/ $\sigma$ Inference (at 95% confidence limit) $i = 200, \sigma = 36.96846$
	Female				Male					
Total length	37.19	±4.28439407986458	31.2	43.45	38.15	±2.12909883333432	33.65	42.85	161	-1.0549535 no difference
Std.Length	29.33	±3.96761309658725	24.3	35	30.84	±1.16173463769544	28	33.15	156	-1.1902039 no difference
Body depth	10.00	±1.80278519898634	8.2	13	9.95	±0.521842888233625	9.05	10.82	162	-1.0279034 no difference
Body width	2.44	±0.351859346898728	1.62	3	2.19	±0.304413154152465	1.78	2.75	280	2.16400712 difference
Head depth	5.87	±0.601526785508514	5	6.95	5.66	±0.568209329477498	4.2	6.6	234	0.91970303 no difference
Head length	8.16	±1.25703242850605	6.25	10	9.01	±0.534168069352506	8.15	9.9	133	-1.812356 no difference
Head width	3.40	±0.343763612170686	2.9	3.9	3.56	±0.272355707814161	2.8	4.1	137	-1.7041556 no difference
Eye diameter	2.87	±0.352030202053586	2.25	3.8	3.02	±0.335704679113871	2.75	4.05	159	-1.1090537 no difference
Snout length	1.98	±0.254732057371334	1.5	2.3	2.01	±0.185738922599492	1.6	2.45	171	-0.7844526 no difference
Inter orbital space	1.59	±0.398170487156076	1.15	2.2	1.88	±0.220808919537611	1.35	2.2	116	-2.2722075 difference
Pre dorsal length	15.45	±2.209337302403	12.2	18.85	16.13	±0.846572035048514	14.95	18.7	148	-1.4066046 no difference
Post dorsal length	10.88	±1.74185744778986	8.3	13.55	11.63	±0.856344126597418	9.9	13.05	148	-1.4066046 no difference
Pre relvic distance	14.56	±2.1055337490577	11.2	17.55	15.06	±0.602249074194786	14	16.15	146	-1.4607048 no difference
Length dorsal fin	8.21	±1.06149844435515	7	9.85	8.02	±0.519640564033891	7.15	8.9	200	0 no difference
L.Base soft dorsal	4.45	±0.846308392216957	3.3	5.7	4.31	±0.443157035253588	3.2	4.9	188	-0.3246011 no difference
L.Base anal fin	2.59	±0.496169272898291	1.94	3.85	2.73	±0.435731387560344	2.05	3.6	157	-1.1631538 no difference
L.Pectoral fin	5.98	±1.04816368247672	4.5	7.5	5.67	±0.535447427268477	5.1	6.8	239	1.05495347 no difference
L.Pelvic fin	5.28	±0.71572910929676	4.2	6.55	5.40	±0.291028575193134	4.81	5.75	178	-0.595102 no difference
Depth caudal peduncle	3.79	±0.440935309731965	3.15	4.6	3.94	±0.238346828227949	3.6	4.35	143	-1.5418551 no difference
Length caudal peduncle	7.03	±0.853573910714608	5.6	8.3	7.63	±0.472806569996216	6.65	8.15	117	-2.2451574 difference

Measurement of males and females are statistically compared using Mann Whitney U test



Map of Assam and Manipur showing places of collection of the fish

adapt to both the habitats. The beels of Hajo area has connection to the river Brahmaputra through two tributaries Lakhaitara and Boilla. During flood there is no demarcation in these beels and many riverine fishes occur in the beels. A thorough survey in these beels for ichthyofaunal diversity may lead to the record of many hitherto unknown species.

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