

Morphometric study of hill stream fish *Danio aequipinnatus* of Kakolat fall of Nawada, Bihar

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ABSTRACT

Danio aequipinnatus is widely known as Giant danio. It has vivid blue and yellowish stripes on its body and can achieve a height of 10 cm. *Danio aequipinnatus* is widely distributed throughout the Indian sub-continent including Thailand and China. In India, it is distributed in Arunachal Pradesh, Sikkim, Assam, Manipur Meghalaya, Nagaland, Tripura, West Bengal, Bihar, Orissa, Madhya Pradesh, Maharashtra, Rajasthan, Gujarat, Andhra Pradesh, Karnataka Tamil Nadu and Kerala. It is also found in Pakistan. *Danio aequipinnatus* mainly lives at high elevations. These are valued commercially in India as aquarium decorative fish. The aim of present study is to elaborate the morphometry of *Danio aequipinnatus* in Nawada District of Bihar.

Key Words - *Danio aequipinnatus*, Morphometry, hill, water current, Nawada

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INTRODUCTION

The climatic factors, water regime, geographical differences, and structural variations of the hill streams and water bodies of the Eastern Ghats are well adapted to just a small number of fish species. To survive in water, they first adapted and then gradually acquired certain unique modifications. Their modification was permanent and modified from integument. These features help in avoid stress in critical environmental conditions like floods in rainy season or lack of flow conditions during summer seasons. At first the structural modifications were found in hill stream fishes by Hora (1922, 1930). sufficient material on the adaptations of Indian stream fishes is accessible Singh and others (1983). Kulkarni (1971) and Nautiyal have devised plans for the protection of hill stream fishes, in particular Mahaseer (1984).

The current study concentrated on hill stream fish *Danio aequipinnatus* of Kakolat fall of Nawada,

Bihar. The Kakolat waterfall is situated on the Bihar border 33 kilometres from Nawada and 4 kilometres from Thali Bazar (the last turn leading to Kakolat waterfall). At its base, the Kakolat waterfall creates a natural reservoir as it rushes down from a height of between 150 and 160 feet. The drop is roughly 49 metres (160 feet) tall. It is surrounded by forests and is close to the Govindpur police station.

MATERIAL AND METHOD

The present study of hill stream fish *Danio aequipinnatus* of Kakolat fall of Nawada, Bihar for total two years period 2014 to 2016. The adaptive stream fishes collected with the help of local fisherman from the sampling station and were fixed in 7% formalin and identified according to Day (1978).

Morphological Analysis

The Fang approach involved morphometric measures and meristic counts (1997a and 1997b). When possible, measurements were made using a digital caliper with a precision of 0.01 mm in the left side of the specimens. Under a dissection

microscope, superficial osteological characteristics were seen.

RESULT

The following results were obtained after morphological measurement.

Length

Table 1- Table shows the morphological measurement of *Danio aequipinnatus*

No of Specimens	Average length cm	Head length	Body Depth	Average eye diameter in mm	Width of head mm
10	8.4	3.63	3.13	3.2	1.68
10	8.4	3.52	3.17	3.0	1.75
10	8.9	3.44	3.33	3.4	1.72
10	8.7	3.69	3.23	3.1	1.73
10	9.0	3.75	3.29	3.1	1.69
Average	8.68	3.60	3.23	3.1	1.74

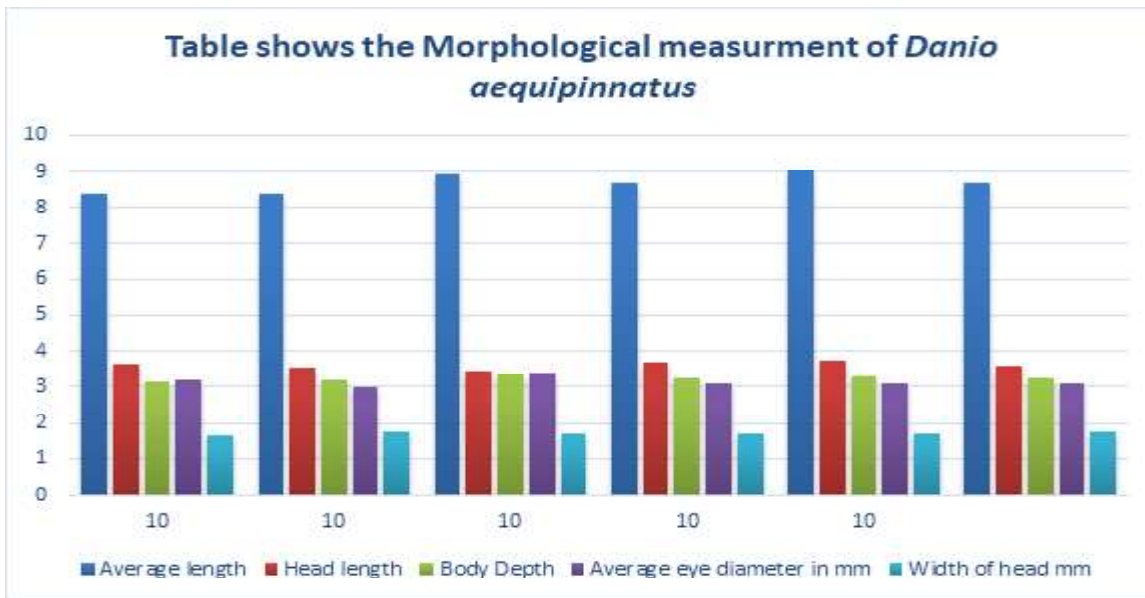


Table 2- Table shows the Average Predorsal distance, Prepelvic distance, Caudal peduncle length of *Danio aequipinnatus*

No of Specimens	Predorsal distance mm	Prepelvic distance mm	caudal peduncle length mm
10	1.64	2.08	4.56
10	1.67	2.14	4.57
10	1.60	2.19	4.59
10	1.64	2.04	4.62
10	1.65	2.09	4.67
Average	1.64	2.10	4.60

Scales

Table 3- Average no of different scales of *Danio aequipinnatus*

No of Specimens	Lateral line scales	Lateral transverse row of scales No.	Predorsal scales No.	Circumpeduncular scales
10	35	10	14	10
10	36	10	14	11
10	35	11	14	11
10	35	10	14	10
10	37	10	14	10
Average	35.6	10.2	14	10.4

Fin Ray

Table 4- Table shows the Fin Dorsal Ray of *Danio aequipinnatus*

No of Specimens	Fin Dorsal Ray ii/iii No.	Fin Anal Ray ii/iii No.	Fin Pectoral rays ii/iii No.	Fin Pelvic rays ii/iii No.	Fin Caudal Ray ii/iii No.
10	11	14	11	8	19
10	12	15	11	8	19
10	11	14	11	8	19
10	12	14	11	8	19
10	11	14	11	8	19
Average	11.4	14.2	11	8	19

DISCUSSION

The *Danio* (*Danio aequipinnatus*) is a tropical fish that is one of the largest among Danionins. It is a member of the Cyprinidae family of minnows. McClelland described this Giant *Danio*-fish in 1839 from Assam and its members are distributed throughout the freshwaters of South and Southeast Asia, from Pakistan to Thailand.

The collected specimen of *Danio aequipinnatus*, measuring total length of 86.8 mm, standard length of 85 mm and total weight of 7.105g was recognized by the presence of post-dorsal dome and a trough between dorsal and caudal regions. The number of lateral line scales was 35 and lateral line scales have run from anterior to the posterior end of the body. Diagnosis confirmed on the basis of 50 specimens, Head length range from 3.44-3.75 and body depth 3.11-3.33 in standard length. Eye diameter 3.00-3.4 in head length and eye provided with a pre-orbital backwardly directed spinous process at the anterior rim of orbit. Lateral line

scales 35-37. Barbels 2 pairs. Lateral line complete covering 35-37 scales; lateral transverse row of scales 10-11, 2.5 rows of scales between lateral line and base of pelvic fin. Predorsal scales 14 and circumpeduncular scales 10-11.

Body and head compressed. The pelvic-fin origin was the deepest part of the body. Compared to the ventral body surface profile, the dorsal body surface profile is a little more rounded. The length of the snout was somewhat longer than the diameter of the eyes. An oblique mouth cleft that extends under the orbit's anterior edge and has a knobby appearance at the symphysis. When the mouth is closed, a sizable, rounded symphyseal knob on the lower jaw fits into a shallow groove on the inner border of the upper jaw.

Danio aequipinnatus possess dorsal rays i~i1/11-12, Anal rays ili-ilii/14-15, pectoral rays 1/11-12, pelvic rays 1/7-8 and caudal rays 19. Height of dorsal 4.99 (4.09-6.15), height of anal 5.72 (5.14-6.36), pectoral length 4.47 (4.00- 5.00) and pelvic length

6.84 (6.00-7.37) in standard length. Pectoral fin extending to pelvic fin. Both the paired fins possess scaly flap at their bases.

The frequency distribution statistics of scan counts and fin ray counts corroborate Hora and Nair's (1941b) and Mukerji's (1934) opinions that *D. strigillifer*, *D. malabaricus*, and *D. browni* should be considered synonyms for *Danio aequipinnatus*.

CONCLUSION

On the basis of observation, it is concluded that the average length of the body of *Danio aequipinnatus* was 8.68, length of head was 3.6, lateral line possesses average 35 scales, whereas no of lateral transverse row of scales was 10. The average number of dorsal fin ray was 11 whereas number of caudal fin rays were 19.

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