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Biometric characters of freshwater fish *Securicula gora* (Hamilton, 1822) From Meghadrigedda Reservoir, Visakhapatnam, Andhra Pradesh, India

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Abstract

Securicula gora is a commercially important SIS (small indigenous species) fish of India. Biometric characters include both morphometric and meristic characters. Morphometric characters have been commonly used in fisheries biology as powerful tools for measuring discreteness and relationships among various taxonomic categories (Quilang *et al.*, 2007) [13]. In the present study 25 fish samples of *Securicula gora* of variable sizes ranging from 13.4-16.8 mm in total length (TL) were sampled from Meghadrigedda Reservoir, Visakhapatnam. These specimens were allowed to measure various morphometric and meristic characters. The minimum and maximum range, mean, standard deviation, percentage of various parameters in total length were estimated.

Keywords: Biometric characters, Morphometric, meristic characters, *Securicula gora*, Meghadrigedda Reservoir, Visakhapatnam.

Introduction

This fish is commonly called Gora chela (English). Local names of this fish in India are Selkona and Chelekona (Assam); Ghora-chela (west Bengal); Chelul and Chelua (Bihar and Uttar Pradesh); Bouchi and kandul (Punjab); and Humcatchari (Orissa) (Talwar and Jhingran, 1991) [18]. This fish is synonymed as *Chela gora* (Hamilton, 1822) [6], *Cyprinuyus gora* (Hamilton, 1822) [6], *Leuciscus cultellus* (Valenciennes, 1844), *Opsarius pholicephalus* (McClelland, 1839), *Oxygaster gora* (Hamilton, 1822) [6], *Pseudoxygaster gora* (Hamilton, 1822) [6]. It lives in beels, rivers and canals (Rahman, 2005) [15]. Surface feeder (Shafi and Quddus, 2001) [16], predatory in nature and feeds regularly on insects, insect larvae and crustaceans (Rahman, 1989 and 2005 [14, 15]; Shafi and Quddus, 2001) [16]. Morphologically, its abdominal edge keeled from below pectoral to anus. Directed mouth with longer lower jaw having prominent symphyseal knob. Dorsal originate in advance of anal. Strong and well-built pectorals and pelvis having well-developed axillary scales and lower lobe of caudal longer. Maximum lengths: 24.5 cm (Rahman, 1989 and 2005) [14, 15], 23cm (Talwar and Jhingran, 1991) [18] and 22.8 cm (Shafi and Quddus, 2001) [16]. Lateral line complete and curved downwards. 140-160 (Rahman, 1989 and 2005; Shafi and Quddus, 2001) [14, 15, 16] 120-160 (Talwar and Jhingran, 1991) [18] scales on lateral line and the bright body uniformly silvery in colour. (Figure: 1).



Fig 1: *Securicula gora*

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Morphometric and meristic characters are helpful in easy & correct identification of fish species in laboratory as well as at natural places (Jayaram, 1999) [8]. It is common to use morphometric measurements to identify and classify fishes (Begenal and Tesch, 1978) [12]. Morphometric study is a powerful tool for characterizing strains / stocks of the same species, which involves detection of subtle variation of shape, independent of size. The complete set of measurements used to describe a form is a morphometric character set (Strauss and Bond, 1990) [17]. The studies of morphological and meristic characters of a fish give substantial information with regard to exact identification key of the species (Dhanya *et al.*, 2004) [4] and such identification is prerequisite for cytogenetic and molecular investigations.

Systematic Position

Phylum: Chordata
 Class: Actinopterygii
 Order: Cypriniformes
 Family: Cyprinidae
 Genus: *Securicula*
 Species: *gora*
 Common name: Gora chela.

Materials and Methods

Meghadrigedda Reservoir is a major drinking water source of Visakhapatnam city, a perennial freshwater stream located 15 Km. south of Visakhapatnam. The study area covers 374 km² and it is located in between 17° 47' 29" and 17° 56' 47"

Northern Latitudes and 83° 2' 7" and 83° 16' 25" Eastern Longitudes. (Figures: 2 & 3). Specimens of *securicula gora* were caught by the traditional fishing gears including *jhaki jal* (cast net), *tar jal* (square lift net) and *dughair* (conical trap) (Kibria & Ahmed 2005) [10] from Meghadrigedda Reservoir. Samples were immediately preserved with ice in the fish landed area and fixed with 5% formalin on arrival at the laboratory. The methods of Dwivedi and Menezes (1974) [5], and Jayaram (1981, 2002) [7, 9] were followed for morphometric measurements and meristic counts. For precision of measurement, divider and measuring board having graduation in mm was used. In the present study, 18-morphometric and 9-meristic characters were taken to study. The minimum and maximum range, mean, standard deviation, percentage of various parameters in total length were estimated.



Fig 2: Meghadrigedda Reservoir



Fig 3: Google map of Meghadrigedda Reservoir

Morphometric characters refer to measurable structures such as total length, standard length, fork length, head length, snout length, eye diameter, etc... were counted.

Meristic characters include countable structures such as dorsal fin rays, anal fin rays, caudal fin rays, lateral line scales, scales above lateral line, etc... were counted.

Results and Discussion

A total of 25 specimens ranging from 13.4-16.8 mm TL (Total length) was used for the studies of morphometric and meristic characteristics. The main morphometric and meristic data are reported in Table 1 and 2, respectively. Body of this fish is

fairly elongate and compressed. Eyes large. Mouth slightly upward. Lower jaw longer. Lateral line concave. Dorsal fin short, inserted in opposite advance of anal fin. Pectoral fin long. Scales very small. Body colour bright silvery. It shows breeding during April to August. Information on the biology of *S. gora* is scanty, only Das *et al.* (2002) [3] reported on the monthly size frequency distribution and length-weight relationship; and Ahsan *et al.* (2004) [1] reported only on the fecundity of the species. Proper management of this species can play more effective role in supplying protein and employment to the people.

Table 1: Morphometric measurements of the *Securicula gora* (Hamilton, 1822) ^[6] specimens (n=25) captured from Meghadrigedda Reservoir, Visakhapatnam.

Measurements (cm)	Min	Max	Mean ± SD	TL (%) Mean
Total length (TL)	13.4	16.8	15.08±0.86	
Standard length (SL)	10.6	13.4	11.98±0.70	79.44% TL
Fork length (FL)	10.8	13.6	12.24±0.70	81.16% TL
Pre-dorsal length (PL)	7.4	9.6	8.29±0.59	54.97% TL
Post-dorsal length (PDL)	2.9	4.2	3.66±0.30	24.27% TL
Head length (HL)	2.1	2.6	2.41±0.15	15.98% TL
Snout length (SnL)	0.5	0.7	0.62±0.0	4.11% TL
Eye diameter (ED)	0.5	0.7	0.60±0.02	3.97% TL
Inter orbital width (IOW)	0.5	0.7	0.59±0.06	3.91% TL
Mouth length (ML)	0.4	0.6	0.51±0.07	3.38% TL
Dorsal fin length (DFL)	0.7	1.1	0.95±0.11	6.29% TL
Anal fin length (AFL)	1.2	2.1	1.66±0.19	11.00% TL
Pectoral fin length (PFL)	0.4	0.7	0.59±0.06	3.91% TL
Pelvic fin length (PFL)	0.3	0.4	0.32±0.04	2.12% TL
Caudal fin length (CFL)	1.0	1.9	1.31±0.22	8.68% TL
Caudal peduncle length (CPL)	1.1	2.1	1.55±0.24	10.27% TL
Caudal peduncle depth (CPD)	0.9	1.2	1.03±0.07	6.83% TL
Height of the body	2.4	3.5	2.82±0.27	18.70% TL

Table 2: Meristic counts of the *Securicula gora* (Hamilton, 1822) ^[6] specimens (n=25) captured from Meghadrigedda Reservoir, Visakhapatnam.

Meristic data	Number
Dorsal fin rays	9
Anal fin rays	15
Pectoral fin rays	13
Pelvic fin rays	8
Caudal fin rays	19
Scales along lateral line	120
Scales above lateral line	16
Scales below lateral line	5
Scales before dorsal fin	42

Conclusion

Based on available information *securicula gora* is small indigenous fish species. This is low cost food fish. Due to its high nutritional value essential in preventing malnutrition in rural communities particularly of vulnerable groups such as poor women and children. Biometric characters are important for identifying fish species and their habitat as well as ecological criteria in any stream, lake or sea. The above reported morphometric measurements and meristic counts useful to identify *securicula gora* and this is the first report from Meghadrigedda Reservoir, Visakhapatnam, Andhra Pradesh, India.

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