

ON A COLLECTION OF FISHES FROM SIKKIM

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I—INTRODUCTION

Sikkim is a small state, lying between latitude 27°5' and 28°9' N and longitude 86°59' and 88°56' E. This mountainous area lies wedged in between Tibet on the north, Bhutan on the east, Nepal on the west and the Indian state of West Bengal on the south. The only source of fish in this small state are rivers, namely the Lachen, the Lachung, the Zemu, the Talung, the Great Ranjeet, the Rangoli and the Rangpo; the Teesta river, which originates from Lhamo lake and enters West Bengal, gathers water from many of them. The importance of the knowledge of the fish fauna of this state would be fully realized by those engaged on the comparative studies of the ichthyo-faunae of the different regions along the Himalaya as well as by those, working on the Indo-central Asiatic faunae.

As early as 1845, McClelland described two species of the genus *Puntius* viz. *Puntius spinulosus* (McClelland) (= *Barbus spinulosus* McClelland) and *Puntius clavatus* (McClelland) (= *Barbus clavatus* McClelland) and one anabantid, *Ctenops nobilis* McClelland of his new genus *Ctenops* McClelland. All the three species were recorded from rivers at the foot of Sikkim mountains on the northern frontiers of Bengal. Günther (1868) mentioned the distribution of *Tor mosal* (Hamilton) (= *Barbus hexastichus* McClelland), *Danio aequipinnatus* (McClelland) (= *Danio lineolatus* (Blyth)) and *Noemacheilus rupecula* (McClelland) in that state. Day (1878) made a mention of these species and also showed the distribution of *Labeo dyocheilus* (McClelland) in Sikkim. Hora (1923) resurrected Günther's species from Nepal, *Glyptothorax gracilis*, on the basis of one specimen from Ranjeet River, Sikkim and in 1935 described two new loaches viz. *Noemacheilus devdevi* Hora and *N. inglisi* Hora from Sikkim. Later, Hora and Silas (1951, 52) recorded *Glyptothorax maculatum* (Ragan) from Sikkim. Menon (1954) attributed the distribution of *Glyptothorax striatus* (McClelland) and *Glyptothorax gracilis* (Günther) to the same place. Menon (1964) showed that *Garra lamta* Hamilton exists in this state. Apart from these short notices, there is no consolidated account of the fishes of Sikkim so far, in literature. By the study of the collection of fishes from Sikkim in the Zoological Survey of India, the present author finds that an equal number of more species with definite material could be added to the fish fauna of Sikkim, already known. In the present paper, therefore, a list of the fishes of Sikkim has been prepared

with the help of the collections lying in Zoological Survey of India and also including those mentioned in the literature. This paper should act as a basis for any future work on the fishes of Sikkim.

II—SYSTEMATIC LIST

A list of 26 species of fishes of Sikkim, based either on the material existing in Zoological Survey of India or on the reports in the literature, is given here. It is expected that some more species might be existing in that area and may come to light through future surveys.

Order SILURIFORMES

Family SISORIDAE

1. *Glyptothorax striatus* (McClelland)
2. *Glyptothorax gracilis* (Günther)
3. *Glyptosternum maculatum* (Regan)
4. *Pseudecheneis sulcatus* (McClelland)
5. *Euchiloglanis hodgarti* (Hora)

Order CYPRINIFORMES

Family CYPRINIDAE

6. *Schizothorax plagiostomus* Heckel
7. *Schizothorax richardsonii* (Gray)
8. *Puntius spinulosus* (McClelland)
9. *Puntius clavatus* (McClelland)
10. *Acrossocheilus hexagonolepis* (McClelland)
11. *Tor mosal* (Hamilton)
12. *Labeo dyocheilus* (McClelland)
13. *Garra lamta* Hamilton
14. *Garra annandalei* Hora
15. *Garra gotyla gotyla* (Gray)
16. *Barilius bendelisis* (Hamilton)
17. *Barilius vagra* Hamilton
18. *Barilius barna* Hamilton
19. *Barilius* sp.
20. *Danio aequipinnatus* (McClelland)
21. *Brachydanio rerio* (Hamilton)

Family COBITIDAE

22. *Noemacheilus devdevi* Hora
23. *Noemacheilus deTerrai* Hora
24. *Noemacheilus inglisi* Hora
25. *Noemacheilus repecula* (McClelland)

Order PERCIFORMES

Suborder ANABANTOIDEI

Family ANABANTIDAE

26. *Ctenops nobilis* McClelland

III—SYSTEMATIC NOTES

Order SILURIFORMES Greenwood *et al.*, 1966.

Family SISORIDAE Gill, 1872.

Genus *Glyptothorax* Blyth, 1860.

1. *Glyptothorax striatus* (McClelland)

1842. *Glyptosternon striatus* McClelland, *Calcutta J. nat. Hist.*, 2 : 587, pl. 6, figs. 1,2 (Type-locality : Khasi hills).

1954. *Glyptothorax striatus* : Menon, *Rec. Indian Mus.*, 52 : 53.

Material.—1 ex., below Gangtok, Sikkim, Coll. *F. M. Bailey*.

Remarks.—The skin is granulated. The supraoccipital spine does not reach the basal bone of the dorsal fin. The head and anterior part of the body are depressed. The dorsal fin is higher than the body. The paired fins are strongly plaited.

Distribution.—Sikkim, Assam.

2. *Glyptothorax gracilis* (Günther)

1864. *Glyptosternon gracile* Günther, *Cat. Fish. Brit. Mus.*, 5 : 186 (Type-locality : Nepal).

1954. *Glyptothorax gracile* : Menon, *Rec. Indian Mus.*, 52 : 48.

Material.—1. ex. from Ranjeet river, Manjhitar, Sikkim, Coll. *B. L. Chaudhuri*, 1913.

Remarks.—The skin is granulated. The supraoccipital spine touches the basal bone of the dorsal fin. The adhesive thoracic apparatus is longer than broad.

Distribution.—Sikkim, Nepal.

Genus *Glyptosternum* McClelland, 18423. *Glyptosternum maculatum* (Regan)

1905. *Parexostoma maculatum* Regan, *Ann. Mag. nat. Hist.*, (7) 15 : 183 (Type-locality : Lhasa, Tibet).

1951. *Glyptosternum maculatum* : Hora & Silas, *Rec. Indian Mus.*, 49 : 10.

Material.—1 ex. (damaged), Sikkim, Coll. *Lord Carmichael*.

Remarks.—The jaws have bands of conical teeth. The gill openings extend to ventral surface of the body. The pectoral fin has 11 rays. The rayed and adipose dorsal fins are separated from each other. The least height of the caudal peduncle is equal to half of its length. The head and body are greatly depressed.

Distribution.—Sikkim, Tibet.

Genus *Pseudecheneis* Blyth, 1860.4. *Pseudecheneis sulcatus* (McClelland)

1842. *Glyptosternon sulcatus* McClelland, *Calcutta J. nat. Hist.*, 2 : 587, pl. 6 (Type-locality : Khasi hills).
 1877. *Pseudecheneis sulcatus* : Day, *Fish. India*, : 500, pl. 116, fig. 1.

Material.—1 ex., juvenile. Kholā river, near Gangtok, Indo-Swiss Sikkim Expedition, 1959.

Remarks.—In this specimen, the length of the head is 6.6 times in the total length (*Vs.* 7.5 times) and there are 15 transverse folds in the thoracic apparatus on the chest instead of 14. The gill openings are small and do not extend to the lower surface of the head. The gill membranes are attached to broad isthmus.

Distribution.—Sikkim, Assam, Darjeeling.

Genus *Euchiloglanis* Regan, 19075. *Euchiloglanis hodgarti* (Hora)

1923. *Glyptosternum hodgarti* Hora, *Rec. Indian Mus.*, 25 : 38. (Type-locality : Nepal, Pharping and Abor hills).
 1951. *Euchiloglanis hodgarti* : Hora & Silas, *Rec. Indian Mus.*, 49 : 17.

Material.—2 exs., Somdong, 4.8 Kms. down of Chakung, W. Sikkim, 3. iii. 1959, Coll. A. G. K. Menon.

Remarks.—According to Hora and Silas (1951) the number of the branched rays in the pectoral fin is a very important character in separating the glyptosternoid genera as well as the species of the genus *Euchiloglanis* Regan. According to them *E. hodgarti* (Hora) has 16—17 branched rays in the pectoral fin and is different from *E. davidi* (Sauvage) and *E. myzostoma* Norman, which have 13—15 branched rays in the pectoral.

There are two specimens, from Somdong, 4.8 Kms. down of Chakung, Sikkim, which resemble *E. hodgarti* (Hora) in many characters but significantly differ in having 15 branched rays in the pectoral fin (*Vs.* 16—17 in *E. hodgarti* (Hora)). In addition to this, there are a few other points of difference in the measurements of the body. The measurements of the body of the two specimens are given below as reference for future workers.

D 1/6, P 1/15, V 1/5, A 4/5, C 3/2

Measurements in millimeters

Total length	116	71
Standard length	103	63
Length of head	23	14
Height of head at occiput	10	6
Width of head at base of pectoral	19	13
Body depth	13	9
Length of snout	10	6
Interorbital width	6	4
Length of caudal peduncle	9	5
Least height of caudal peduncle	7	4

Distance from snout tip to commencement of dorsal	31	20
Distance from snout tip to ventral base	36	22
Distance from snout tip to anal base	85	50
Distance from snout tip to anal opening	82	48.5
Distance from base of ventral to commencement of anal	49	30
Distance from anal opening to commencement of anal	3	1.5
Longest ray of dorsal fin	13	7
Length of pectoral fin	27	12
Length of pelvic fin	17	13
Length of caudal fin	13	8
Length of base of adipose dorsal fin	4	2
Gape of mouth	10	6

Distribution.—Sikkim, Nepal, Darjeeling, and Assam.

Order CYPRINIFORMES Berg, 1940

Suborder CYPRINOIDEI Berg, 1940

Family CYPRINIDAE (Bon, 1837) Gill, 1861.

Genus *Schizothorax* Heckel

6. *Schizothorax plagiostomus* Heckel

1838. *Schizothorax plagiostomus* Heckel, *Fische aus Caschmir* : 16, pl. 1
(Type-locality : Kashmir).
1959. *Schizothorax plagiostomus* : Misra, *Rec. Indian Mus.*, 57 : 166.

Material.—(i) 2 young exs., Rongni Chu, Tardhong, 13.xii. 1952, Coll. Unknown. (ii) 1 young ex. 16. xii. 1952, Coll. Unknown, Sikkim.

Remarks.—In this material the body is cylindrical with a covering of minute scales. There is a suctorial disc on the ventral side of the lower jaw. Along either side of the anal opening, there is a row of enlarged tile-like scales. There are some dark spots on dorsal side of the body.

Distribution.—Jammu, Kashmir, Uttar Pradesh, Assam, Eastern Himalaya, Sikkim, Bhutan, Nepal, Afghanistan.

7. *Schizothorax richardsonii* (Gray)

1832. *Cyprinus richardsonii* Gray, *Illust. Indian Zool.*, Hardwicke, pl. 94, fig. 2, (Type-locality : not mentioned).
1877. *Oreinus richardsonii* : Day, *Fish. India*, : 530, pl. 125, fig. 4.

Material.—9 young exs., Ranjeet river, Manjhitar, June, 1913, Coll. B. L. Chaudhuri.

Remarks.—The scales in the lateral line are less than 100. The scales of the anal sheath are equal to 2/3rd of eye diameter and the latter is less than 2 times in the interorbital width.

Distribution.—Uttar Pradesh, Eastern Himalaya, Nepal, Bhutan, Sikkim.

Genus *Acrossocheilus* Oshima, 1919

8. *Acrossocheilus hexagonolepis* (McClelland)

1839. *Barbus hexagonolepis* McClelland, *Indian Cyprinidae* : 270, 313, pl. 41, fig. 3 (Type-locality : Upper Assam).

1959. *Acrossocheilus hexagonolepis* : Misra, *Rec. Indian Mus.*, 57 : 148.

Material.—(i) 2 young exs., Rongni Chu, Tardong, North of Martin, 13. xii. 1952, Coll. Unknown; (ii) 24 young exs., Martin river, Martin, 16. xii. 1952, Coll. Unknown; (iii) 1 ex., Rani Khola, Rani pool, 15. viii. 1959, Coll. A. G. K. Menon ; and (iv) 1 ex., Rishi Khola, Rishi, 15. iv. 1959, Coll. A. G. K. Menon.

Remarks.—The species is distinguishable by the presence of a group of horny tubercles on cheeks and the lower lip is separated from the jaw which has a horny covering. In the young examples, there is a dark spot at the base of the caudal fin while the same is absent in the adults.

Distribution.—Throughout Eastern Himalaya, Assam, Burma, and further east, Sikkim, Nepal, Pakistan.

Genus *Tor* Gray, 1834.

9. *Tor mosal* (Hamilton)

1822. *Cyprinus mosal* Hamilton, *Fish. Ganges* : 306, 388 (Type-locality : Kosi river).
1940. *Barbus (Tor) mosal* : Hora, *J. Bombay nat. Hist. Soc.*, 41 : 784-94.

Material.—(i) 2 exs. from unspecified locality in Sikkim, Oct., 1928, Coll. Unknown. (ii) 49 exs. (young), Rongpo Chu, Rongpo, 8.xii.1952, Coll. Unknown.

Remarks.—In these specimens (measuring 205—256 mm.) the fin rays are D 4/9, V 1/8, A 3/5. There are 23 scales along the lateral line. The length of head is slightly smaller than the depth of the body. There are 4 barbels. The dorsal spine is bony and smooth. Eye diameter is nearly 5 times in length of head. Hora (1940) recorded, in Burmese specimens, that the eye is 3.3-4.2 times in head length. This may be due to difference in size of the fish.

In the young examples, the snout is smooth and there is a black spot at the base of the caudal.

Distribution.—Throughout Himalaya, Sikkim, Bhutan.

Genus *Garra* Hamilton, 1822

10. *Garra lamta* Hamilton

1822. *Cyprinus (Garra) lamta* Hamilton (in part), *Fish. Ganges*, : 344, 393 (Type-locality : Tinau river, tributary of Rapti river, at Butwal (Nepal), 33.6 Kms. North of Nautanwa in Gorakhpur, U. P.).
1964. *Garra lamta* : Menon, *Mem. Indian Mus.*, 14 (4) : 208.

Material.—(i) 1 ex., Chatra, Sikkim (ii) 18 exs., Ranjeet river, Manjhitar, (iii) 1 ex., Rongni Chu, Martin.

Remarks.— There are two pairs of barbels and 34 scales along the lateral line. The distance of the vent from base of anal fin is 4.5—5.0 times in that between anterior origin of the pelvics and the anal fin.

Distribution.—Darjeeling Himalaya, Eastern Nepal, Sikkim.

11. *Garra annandalei* Hora

1921. *Garra annandalei* Hora, *Rec. Indian Mus.*, 22 : 657 (Type-locality : Mahananda river, below Darjeeling).
 1964. *Garra annandalei* : Menon. *Mem. Indian Mus.*, 14 (4) : 217.

Material.—(i) 1 ex., Hi, west of Pachrek, 3.iv. 1959, Coll. A. G. K. Menon, (ii) 12 exs., Rishi Khola, Rishi, 15. xii. 1959, Coll. A. G. K. Menon.

Remarks.—It resembles *Garra lamta* Hamilton but differs only in having the tip of the snout being marked off by a deep transverse groove and that the distance of the vent from the base of anal fin is nearly 3 times in that between anterior origin of pelvic and anal fins.

Distribution.—Darjeeling Himalaya, Nepal, Sikkim.

12. *Garra gotyla gotyla* (Gray)

1832. *Cyprinus gotyla* Gray, *Illust. Indian Zool. Hardwicke*, 1, pl. 88, figs. 3,3a (Type-locality : Northern India).
 1964. *Garra gotyla gotyla* : Menon, *Mem. Indian Mus.*, 14 (4) : 233.

Material.—(i) 5 young exs., Rishi Khola, Rishi, 12.iv. 1959, Coll. A. G. K. Menon ; (ii) 1 young ex., Dikchi khola, 14. viii. 1959. Coll. A. G. K. Menon ; and (iii) 2 exs., Khola river, Gangtok, 1959, Coll. A. G. K. Menon.

Remarks.—There is a mild probosis with a single projection, without lateral lobes on the snout. The height of the body is slightly more than 5 times in the standard length.

Distribution.—Assam, Chota Nagpur plateau, Vindhya Mountains, Upper Burma, Pakistan, Sikkim.

Genus *Barilius* Hamilton, 182213. *Barilius bendelisis* (Hamilton)

1807. *Cyprinus bendelisis* Hamilton, *Journey Mysore*, 3 : 345. pl. 32, (Type-locality : rivers of mysore).
 1822. *Cyprinus (Barilius) bendelisis* : Hamilton, *Fish. Ganges*, : 270, 385.
 1959. *Barilius bendelisis* : Misra, *Rec. Indian Mus.*, 57 : 141.

Material.—1 ex., Martin river, 16. xii. 1952, Coll. Unknown.

Distribution.—Throughout India, Sikkim, Pakistan, Ceylon.

14. *Barilius vagra* Hamilton

1822. *Cyprinus (Barilius) vagra* Hamilton, *Fish Ganges* : 269, 385 (Type-locality : Ganges at Patna).
 1878. *Barilius vagra* : Day, *Fish. India* : 589, pl. 148, fig. 3.

Material.—3 exs., Ranjeet river, Manjhitar, June, 1913, Coll. B. L. Chaudhuri.

Remarks.—There are four barbels and 12-13 dark bands descending from the back to the lateral line. Hora (1937) stated that

Barilius modestus Day was simply a colour variant of *B. vagra* Hamilton, on the assumption that the specimens of the latter species, from Nepal in his collection, bore no colour bands. A specimen in the present collection, too, lacks colour bands completely. This species is distinguished from *B. modestus* Day, on characters other than the colour bands. The absence of the colour bands could be attributed to the particular ecological conditions.

Distribution.—Assam, Bengal, Bihar, Punjab, Jammu, Himachal Pradesh, Uttar Pradesh, Sikkim, Nepal, Pakistan, Ceylon.

15. *Barilius barna* Hamilton

1822. *Cyprinus (Barilius) barna* Hamilton, *Fish. Ganges*, : 268. 384, (Type-locality : Yamuna and Brahmaputra rivers).
1878. *Barilius barna* : Day, *Fish, India*, : 592, pl. 147, figs. 1, 2.

Material.—2 exs., unspecified locality of Sikkim, Coll. Unknown.

Distribution.—Assam, Bengal, Bihar, Orissa, Sikkim, Pakistan.

16. *Barilius* sp.

Material.—1 ex., Ranjeet river, Manjhitar, June, 1913, Coll. B. L. Chaudhuri.

Remarks.—There is one specimen of the genus *Barilius* which resembles *B. bonarensis* Chaudhuri (from Garhwal, U. P.) in a few characters but differs in another few. Since there is only one specimen, I give here only its description and leave it to be compared in future, if more specimens from the same locality are procured.

D. 2/7, P. 1/13, V. 1/8, A. 3/11, C. 19

Head 4.4 in standard length, 5.5 in total length. Depth of body 5.1 in standard length, 6.5 in total length. Eye diameter 3.3 in head length; equal to inter-orbital width. Snout smaller than diameter of eye. Two pairs of barbels; mandibular pair extremely small, maxillary ones nearly 1/3rd head length. Pectoral fin smaller than head, does not reach pelvics; the latter reach anal opening. Dorsal origin midway between eye and base of caudal fin. Caudal deeply forked. 45 scales along lateral line, 20 rows ahead of dorsal fin.

Measurements in millimeters

Total length	74.0
Standard length	58.0
Head length	13.3
Depth of body	11.4
Diameter of eye	4.0
Snout length	3.1
Interorbital width	4.0
Maxillary barbels	4.4
Pectoral fin	11.2
Length of caudal peduncle	13.0
Least height of caudal peduncle	5.5

Genus **Danio** Hamilton, 182217. **Danio aequipinnatus** (McClelland)

1839. *Perilampus aequipinnatus* McClelland, *Indian Cyprinidae*, : 395, pl. 60, fig. 1 (Type-locality : Assam)
 1878. *Danio aequipinnatus* : Day, *Fish. India.*, : 596, pl. 110, fig. 5.

Material.—34 exs., Ranjeet river, Manjhitar, June, 1913, Coll. B. L. Chaudhuri.

Distribution.—Assam, Bengal, Darjeeling, Sikkim, Penninsular India, Bangla Desh, Burma, Ceylon.

Genus **Brachydanio** Weber & Beaufort, 191618. **Brachydanio rerio** (Hamilton)

1822. *Cyprinus rerio* Hamilton, *Fish Ganges*, : 323, 390 (Type-locality : Kosi river).
 1878. *Danio rerio* : Day, *Fish. India* : 597, pl. 111, fig. 4.

Material.—4 exs., Rorathong, near Pakyang, 28.1.1941, Coll. S. L. Hora.

Distribution.—Bengal, Bihar, Uttar Pradesh, Peninsular India, Sikkim.

Genus **Noemacheilus** van Hasselt, 182319. **Noemacheilus devdevi** Hora

1935. *Noemacheilus devdevi* Hora, *Rec. Indian Mus.*, 37 : 54. (Type-locality : Eastern Himalaya, small streams below Darjeeling and in Sikkim).

Material.—(i) 5 exs., Rongni Chu, Tardong, 13. xii. 1952, Coll. Unknown. (ii) 1 ex., Martin river, Martin, 16. xii. 1952, Coll. Unknown,

Distribution.—Eastern Himalaya, Sikkim.

20. **Noemacheilus deTerrai** Hora

1936. *Noemacheilus deTerrai* Hora, *Mem. Conn. Acad. Arts. & Science*, 10 : 311 (Type-locality : North India, Yale North India Expedition, 1932).

Material.—2 exs., Ranjeet river, Manjhitar, June, 1913, Coll. B. L. Chaudhuri.

Remarks.—The species is characterised by the presence of elongated dorsal fin and the elongated caudal peduncle. The shape of the caudal fin is characteristic of the species.

Distribution.—Northern India, Sikkim.

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V—SUMMARY

The collection of fishes from Sikkim, lying in Zoological Survey of India, Calcutta, has been studied. A list of 26 species of fishes, known so far from this state, is prepared, and interesting characters of the material are recorded.

VI—REFERENCES

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