NOTES ON FISHES IN THE INDIAN MUSEUM.

XXIV. Loaches of the genus *Nemachilus* from Eastern Himalayas, with the description of a New Species from Burma and Siam.

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(Plate III)

The Nemachili of Eastern Himalayas are of special interest, as almost all the loaches (Cobitidae) described by Hamilton[1] in his "Gangetic Fishes" were obtained from the northern or north-eastern parts of Bengal. From the following table it is clear that the 12 species of loaches described by Hamilton were obtained during the period he carried out a survey of Bengal. In 1807, he surveyed the district of Dinajpur and from the commencement of the rainy season of 1808 till the advent of the cold weather, he was stationed at Goalpara. The first half of 1809 was spent in surveying Rangpur and during the cold weather of 1809-10 he was in the Purnea district. The rainy season of 1810 was spent at Nathpur near the Nepal frontier. All these districts are situated along the base of the Eastern Himalayas.

In the following table I give a list of the twelve species described by Hamilton with relative information as to their provenance and dates of descriptions of the different species in his "Original Notes."

"Gangetic Fishes."		"Original Notes."	
Scientific Name.	Locality.	Locality.	Date of description.
**Cobitis botia*, p. 350	North-eastern parts of Bengal.	Goalpara	1st July, 1808.
„ *gongota*, p. 351	Northern Bengal towards mountains.	Patgong	25th March, 1809.
„ *cucura*, p. 352	Kosi River	Nathpur	4th August, 1810.
„ *guntea*, p. 353	Ponds and fresh rivers of Bengal.	Goalpara	?
„ *dario*, p. 354	Northern rivers of Bengal	Dumdumma	20th October, 1807.
„ *pangia*, p. 355	North-eastern parts of Bengal.	Goalpara	30th July, 1808.
„ *geto*, p. 355	North-eastern parts of Bengal.	„	14th August, 1808.
„ *balgara*, p. 356	Kosi River	Nathpur	7th June, 1810.
* „ *savona*, p. 357	„ „	„	14th July, 1810.
* „ *turio*, p. 358	Brahmaputra River	Goalpara	30th October, 1810.
* „ *bilturio*, p. 359	„ „	„	8th November, 1808.
* „ *corica*, p. 360	Kosi River	Mainayi	29th March, 1810.

[1] Hamilton, *An Account of the Fishes in the River Ganges and its branches* (Edinburgh, 1822).

The drawings of the species discovered during the survey period were executed at Government expense and Hamilton was not allowed to take these drawings with him to Europe after his retirement. Most of the Cobitidae are, therefore, not figured in his monumental work, but his illustrations were reproduced later by McClelland[1] with full acknowledgment.

The five species marked with an asterisk(*) in the above table are without sharp, suborbital spines and are referrable to the genus *Nemachilus*. There has been considerable doubt about the precise specific limits of these species, but a study of the extensive material from round about the type localities has shown that *N. turio* and *N. bilturio* are synonymous with *N. botia*, the differences between them being due to sexual characters (*N. turio* and *N. bilturio* were described from female specimens, while *N. botia* represents male specimens), or to individual variation in colouration. *N. botia* is widely distributed in India and Burma. *N. savona* has been rediscovered and is described in detail; while for Day's *savona*, a new name *N. dayi* has been proposed. *N. corica* is already well known and deserves no further consideration in this place.

After Hamilton, McClelland described several new loaches, mostly from Assam, though there is reason to believe that his *Cobitis* (*Schistura*) *scaturigina* came from the Darjeeling Himalayas. Günther[2] added another *Nemachilus* to the fauna of the Eastern Himalayas by describing *N. beavani* from the Kosi River. Day[3] described *N. multifasciatus* from Darjeeling and Assam. The taxonomy of these three species is very confusing, but an attempt has been made in this paper to define their specific limits. Besides these old forms, two new species—*N. shebbearei* and *N. devdevi*—and a new variety—*N. rupecola* var. *inglisi*—have been found in collections from this area. Of the new species, *N. devdevi* is fairly common in the small streams below Darjeeling Himalayas, while *N. shebbearei* is represented by a single specimen from the Teesta Valley. The new variety, characterised by the presence of well-defined nasal barbels, is an eastern race of the commonest loach of the Western Himalayas.

The specimens described from Burma and Siam as *N. multifasciatus* Day are shown to be specifically distinct and the name *vinciguerrae* is proposed for them.

The nine species of *Nemachilus* from the Eastern Himalayas may be distinguished by the following key:—

A. About 14 branched rays in dorsal. (Body irregularly blotched; caudal fin entire or slightly emarginate) — *N. botia* (H. B.).

B. Not more than 8 branched rays in dorsal.

I. Body without vertical bands.

a. Body with one or two longitudinal series of spots — *N. corica* (H. B.).

b. Dorsal surface and sides with a uniform dull grey colour — *N. shebbearei*, sp. nov.

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[1] McClelland, Ind. Cyp. *As. Res.* XIX, pp. 302-309 (1839).
[2] Günther, *Cat. Fish. Brit. Mus.* VII, p. 350 (1868).
[3] Day, *Fish. Ind.*, p. 617, pl. cliii, fig. 7 (1878).

II. Body with vertical bands.	
a. Lateral line incomplete.	
1. Caudal fin without bands; vertical bands few, broad and saddle-shaped, not extending to ventral surface	*N. devdevi*, sp. nov.
2. Caudal fin with four or more bands; body encircled by a number of bands	*N. multifasciatus* Day.
b. Lateral line complete.	
1. Dorsal surface and sides dark with narrow, yellowish bands	*N. savona* (H. B.).
2. Dorsal surface and sides pale-olivaceous with dark, vertical bands separated by broad, yellowish interspaces.	
α. Well-marked nasal barbels	*N. rupecola* var. *inglisi*, nov.
β. Nasal flaps not produced into barbels.	
i. Dorsal and caudal fins marked with numerous, irregular, narrow bands	*N. multifasciatus* Day.
ii. Dorsal with or without a row of spots; caudal with or without 1-3 V-shaped, fairly broad markings.	
* Body with a few broad and bold bands encircling it; a broad, black band at base of caudal; ventrals extending to anal opening	*N. beavani* Günther.
** Body with narrow, incomplete bands not extending to ventral surface; a narrow, black bar at base of caudal; ventrals not extending to anal opening	*N. scaturigina* (McClell.).

In the above key *N. multifasciatus* is given in two places as it may have a complete or incomplete lateral line.

Though, in 1928, I had examined the material of *Nemachilus* in the collection of the British Museum, it was found necessary to refer to the old material again to determine the precise specific limits of the species described by Hamilton, McClelland, Günther and Day. Mr. J. R. Norman very kindly sent me a few duplicate specimens for examination and a sketch of the typical specimen of *N. beavani*. I am most grateful to him for his valuable assistance. The artists of the Zoological Survey of India and Babu R. Bagchi have executed the drawings with their usual skill and care and for this I am thankful to them. I have also to tender my thanks to Messrs. G. E. Shaw and E. O. Shebbeare who sent me an interesting collection of loaches from the Darjeeling Himalayas for study. Dr. B. Prashad has read through the paper and for this my thanks are due to him.

Nemachilus botia (Ham. Buch.).

1934. *Nemachilus botia*, Mukerji, *Journ. Bombay Nat. Hist. Soc.* XXXVII, p. 39, pl. 1, fig. 1; pl. iii, figs. 3 and 4.

Regarding the habitat of *Cobitis botia*, Hamilton[1] remarked that "The *Botia* is found in the rivers of the north-eastern parts of Bengal, and is nearly of the same size and qualities for eating as the *Loach*.' It was characterised as: "A *Cobitis* with a prickle under each eye; with six tendrils; with cloud-like marks on the sides; and with fourteen

[1] Hamilton, *Fish. Ganges*, p. 350 (1822).

rays in the dorsal, and eight in each ventral fin." The ' prickle ' referred to above is the broad, cartilagenous process which is present in the males of several species of *Nemachilus* and is regarded as a secondary sexual character.[1] Female specimens of *N. botia* obtained at Goalpara were described by Hamilton as *Cobitis bilturio*, and, from the nature of colouration and general facies, it seems probable that his *C. turio* from Goalpara is also based on a somewhat abnormal female form of *Nemachilus botia*, the chief differences being that in *C. turio* the dorsal fin is shorter and the dorsal profile is more elevated. The collection before me contains several specimens of *N. botia* from the base of the Darjeeling Himalayas. Mukerji (*op. cit.*) has recently given a detailed description of this form. The species is very variable and is distributed all over northern India and Burma.

Nemachilus shebbearei, sp. nov.

(Plate III, figs. 1 and 2.)

D. 2/8 ; A. 1/6 ; P. 10 ; V. 8 ; C. 18.

The remarkable loach, which I associate with the name of my friend Mr. E. O. Shebbeare, Conservator of Forests, Bengal, possesses a very characteristic facies. The body is low and the head is long and pointed. The dorsal profile is arched, while the ventral profile in front of the anal fin is straight and horizontal. The ventral surface is flattened and the paired fins are placed horizontally. The length of the head is contained 5 times in the total length and 4·1 times in the length without the caudal. The greatest width of the head is almost equal to its height at the occiput and is contained 1·8 times in its length. The eyes are prominent and are situated almost in the middle of the length of the head ; the diameter of the eye is contained 5 times in the length of the head, 2 times in the length of the snout and 1·6 times in the interorbital width. The eyes are dorso-lateral in position and are not visible from the ventral surface. The mouth is situated on the ventral surface slightly behind the tip of the snout ; it is small, semicircular and horizontal. The lips are fleshy and continuous at the angles of the mouth ; the lower lip is interrupted in the middle. The upper jaw overhangs the lower which is sharp and shovel-like. The barbels are subequal and are as long as the diameter of the eye. Below the anterior border of the eye is a bony process which is a characteristic feature of the males of several species of *Nemachilus*. The gill-openings are mostly restricted to the sides.

The body is depressed, while the tail region is compressed from side to side. The greatest depth of the body is contained 9 times in the total length and 7·4 times in the length without the caudal. The body is covered with small scales which are more conspicuous in the posterior region and are totally absent on the ventral surface in front of the anal opening. The lateral line is incomplete, terminating above the anal fin. The caudal peduncle is stout ; its least height is contained 1·4 times in its length.

[1] Hora, *Rec. Ind. Mus.* XXIV, p. 81 (1922).

The dorsal fin is inserted in advance of the ventral and its commencement is slightly nearer to the tip of the snout than to the base of the caudal. It is long and has a concave margin ; its longest ray is considerably greater than the depth of the body below it. The pectoral fin is shorter than the head and is separated from the ventral by a distance less than half of its length. The ventral fin is provided with a fleshy appendage ; it does not extend to the anal opening which is situated almost midway between the tip of the ventral and the commencement of the anal fin. The caudal fin is shorter than the head and is emarginate with somewhat pointed lobes.

In the unique specimen of the species, the colouration is dull black on the dorsal surface and the sides. There are faint indications of colour bands in places. The ventral surface is pale-olivaceous. There is a large black blotch at the base of the caudal fin.

Type-specimen.—F $\frac{11720}{1}$, *Zoological Survey of India, Indian Museum, Calcutta.*

Locality.—Rivers of N. Bengal. (Messrs. G. E. Shaw and E. O. Shebbeare sent to the Indian Museum for identification a large collection of fish from the rivers and streams below Darjeeling. Though the majority of the specimens were properly labelled, some including the type of the species had no indication of any definite locality, but there can be no doubt that they were obtained from the Eastern Himalayas).

Remarks.—*Nemachilus shebbearei* is a *Homaloptera*-like species[1] with a greatly pointed snout and superficially resembles forms like *H. bilineata* Blyth and *H. modesta* (Vinciguerra). The presence of a single undivided ray in the paired fins and the characters of the mouth and its associated structures, however, show that it is a species of *Nemachilus*. From other species of the genus it can be readily distinguished by its characteristic facies and colouration.

Measurements in millimetres.

Total length including caudal	45·0
Length of caudal	8·0
Depth of body	5·0
Length of head	9·0
Width of head	5·9
Height of head at occiput	4·9
Length of snout	3·6
Diameter of eye	1·8
Interorbital width	3·0
Longest ray of dorsal	7·7
Longest ray of anal	4·2
Length of pectoral	8·5
Length of ventral	7·?
Length of caudal peduncle	3·8
Distance between tip of snout and commencement of dorsal	18·0
Distance between commencement of pectoral and that of ventral	10·2
Distance between tip of snout and anal opening	27·0

[1] Hora, *Mem. Ind. Mus.* XII, p. 274 (1932).

Nemachilus devdevi, sp. nov.

(Plate III, figs. 5 and 6.)

1878. *Nemachilus montanus*, Day (in part),[1] *Fish. India*, p. 616.
1889. *Nemachilus montanus*, Day (in part), *Faun. Brit. Ind. Fish.* I, p. 230.

D. 2/8 ; A. 2/5 ; P. 10 ; V. 6-8 ; C. 16.

Nemachilus devdevi is a small and slender species in which the dorsal profile is slightly arched and the ventral profile is almost straight and horizontal. The ventral surface in front of the anal opening is somewhat flattened, and the paired fins are placed horizontally. The head is narrow and broadly pointed ; its length is contained from 4·1 to 5 times in the total length without the caudal. The width of the head is considerably greater than its height at the occiput and is equal to the length of the head behind the nostrils. The depth of the body is contained from 6 to 8 times in the length without the caudal. The head is proportionately smaller and the body more slender in larger specimens. The eyes are dorso-lateral in position and are not visible from the ventral surface ; they are situated nearer to the tip of the snout than to the hinder border of the operculum. The diameter of the eye is contained from 3·6 to 4·2 times in the length of the head and from 1·2 to 1·6 times in the length of the snout. The interorbital width is almost equal to or slightly greater than the diameter of the eye. The eye is proportionately larger in smaller individuals. The nostrils are close to the anterior border of the eye and are separated by a cutaneous fold which terminates in a sharp point. The mouth is semicircular and horizontal, and is bordered by fleshy lips which are continuous at the angles ; the lower lip is imperceptibly interrupted in the middle. The upper jaw is produced in the middle into a broad process ; the lower jaw is sharp and shovel-like. The barbels are subequal and are longer than the diameter of the eye. The gill-openings do not extend very far below the bases of the pectoral fins.

In places the body seems to be covered with small indistinct scales ; but the ventral surface is totally devoid of them. The lateral line is incomplete and terminates above the ventral fin. The caudal peduncle is long and muscular ; its least height is contained from 1·7 to 2 times in its length.

The dorsal fin begins slightly in advance of the ventrals and its commencement is somewhat nearer to the base of the caudal than to the tip of the snout. The longest ray of the dorsal is greater than the depth of the body below it, but is shorter than the longest ray of the anal. The paired fins are similar in shape, being pointed in the middle ; the pectoral fin is somewhat shorter than the head and extends for more than half the distance to the base of the ventral fin which just approaches the anal opening. The ventral fin possesses a well-developed appendage. The anal fin is separated from the base of the caudal by a considerable distance. The caudal fin is lunate, and is as long as the pectoral.

[1] Specimens from " Teesta " referred by Day to this species do not belong to it.

The colouration is very characteristic of the species. There are only a few, broad irregular bands on the body which are much wider than the interspaces between them. The bands extend from the dorsal surface to the sides, in some cases descending below the lateral line while in others they are restricted to the upper half of the body. The dorsal surface of the head is grayish and sometimes marked with short, irregular bars. The general colour of the body is pale-olivaceous while the ventral surface is much paler. The dorsal fin is marked with a series of two black marks across its rays and the proximal half of the caudal fin is invariably coloured gray. There is usually a deep black spot or short bar at the base of the caudal fin.

Type-specimen.—F $\frac{11752}{1}$, *Zoological Survey of India, Indian Museum, Calcutta.*

Locality.—Eastern Himalayas; small streams below Darjeeling and in Sikkim.

Remarks.—*Nemachilus devdevi* is readily distinguished by its slender body, characteristic colouration, incomplete lateral line and proportions. I have great pleasure in associating the name of this species with that of Mr. Dev Dev Mukerji of the Zoological Survey of India.

There are 10 specimens in the British Museum (Nos. 89. 2. 1. 1648-57) from " Teesta " presented by Day as *Nemachilus montanus* (McClelland), but they differ from the form described by Mc Clelland[1] from the Simla Hills. Though the specimens have lost much of their characteristic shape and colouration, they agree very closely with the new species described above. I examined these specimens in London in 1928 and, through the kindness of Mr. J. R. Norman, the authorities of the British Museum recently loaned me two of these specimens for detailed study.

Measurements in millimetres.

Total length including caudal	36·5	43·0	43·4
Length of caudal	6·1	7·3	7·3
Depth of body	5·1	4·7	4·6
Length of head	7·2	7·5	8·0
Width of head	5·0	5·2	5·5
Height of head at occiput	4·0	4·0	3·8
Length of snout	2·4	3·0	3·0
Diameter of eye	2·0	1·8	2·0
Interorbital width	2·1	2·2	2·2
Longest ray of dorsal	5·6	5·3	6·0
Longest ray of anal	6·0	6·0	6·3
Length of pectoral	6·1	7·0	7·8
Length of ventral	5·3	6·4	7·0
Length of caudal peduncle	5·3	7·2	7·0
Least height of caudal peduncle	3·1	3·6	4·0
Distance between commencement of pectoral and that of ventral	9·1	10·2	11·0

[1] McClelland, Ind. Cyprinidae, *As. Res.* XIX, pp. 307, 440, pl. lvii, fig. 1 (1838).

Nemachilus savona (Ham. Buch.).

(Plate III, figs. 3 and 4.)

1822. *Cobitis savona*, Hamilton, *Fish. Ganges*, p. 357.
1839. *Schistura savona*, McClelland, *As. Res.* (Ind. Cyprinidae) XIX, pp. 308, 442, pl. liii, fig. 3 (Reproduced from Buchanan's MS. drawing).
1839. *Acoura obscura*, Swainson, *Fishes* II, p. 310 (Name only).
1846. *Cobitis savona*, Cuvier & Valenciennes, *Hist. Nat. Poiss.* XVII, p. 32.
1854. *Cobitis savona*, Bleeker, *Verh. Bat. Gen.* XXV, p. 70 (Name only).
1868. *Nemachilus savona*, Günther, *Cat. Fish Brit. Mus.* VII, p. 354.

Nemachilus savona is a small loach which was discovered by Hamilton from the Kosi River.[1] The most striking feature of the species is its colouration—" Above the *colour* is dusky, with narrow yellowish bars; below it is white. The fin of the tail is dotted. The eyes are golden." The caudal fin, according to Hamilton, ends in a crescent. So far as I can judge from the literature, the species has never been discovered since Hamilton's time though the name has been used in a loose sense by several ichthyologists[2] for species of *Nemachilus* characterised by narrow bands. Recently, I have obtained abundant material from the base of the Darjeeling Himalayas which undoubtedly is referrable to *N. savona*, and I take this opportunity to redescribe it with figures as the existing descriptions are inadequate.

Among the 144 drawings of fish[3] left behind in India by Hamilton at the time of his departure in 1815, there is a beautiful delineation of *N. savona* (No. 54, labelled *Cobitis Savon Khurika*). It was reproduced by McClelland in his Indian Cyprinidae, and served as the basis of the remarks by Cuvier & Valenciennes and Günther. Günther was so impressed with the colouration of the species that he kept it apart in a section by itself which he characterised as: " Body with narrow yellow transverse bars." The figure shows that there is a row of black dots along the middle of the rays of the dorsal fin. Confusion regarding the identity of this species seems to have been started by Day who referred to it specimens obtained " from the hills near Raniganj " and from " N. W. Provinces." A specimen from the latter locality is figured in his *Fishes of India* (pl. clv, fig. 8). A comparison of Day's figure and description of *savona* with Hamilton's figure and description of *savona* brings out the following differences in colouration :—

Day's *savona*.	Hamilton's *savona*.
1. Ground colour of the dorsal surface of the body is ' purplish.'	Ground colour of the dorsal surface of the body is ' dusky .'
2. Dorsal fin is marked with 4-5 rows of spots and the base marked with blotches.	Dorsal fin is marked with a single row of spots, and the base is devoid of any markings.
3. Caudal fin is marked with several irregular bands.	Caudal fin is marked with three indistinct rows of spots.
4. The number of yellowish narrow bands is 14.	The number of yellowish narrow bands is 9.
5. Ventral and anal fins are banded	Ventral and anal fins are devoid of markings.

[1] According to Buchanan's ' Original Notes ' concerning *Gangetic Fishes*, *Cobitis savona* was obtained in the Kosi River at Nathpur. In my account of *Amblyceps mangois* (*Rec. Ind. Mus.* XXXV, p. 612, 1933), I referred to this locality and indicated that the ecological conditions prevailing there may have been similar to those now found in the small streams at the base of the Eastern Himalayas.

[2] Beavan, *Freshwater Fish India*, p. 109 (1877); Day, *Fish India*, p. 619, pl. clv, fig. 8 (1878); *Faun. Brit. India, Fishes*, I, p. 234 (1889); Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 211 (1890); Jenkins, *Rec. Ind. Mus.* V, p. 128 (1910); Annandale, *Rec. Ind. Mus.* XVI, pp. 125, 127 (1919).

[3] Hora, *Mem. Ind. Mus.* IX, p. 173 (1929).

It is clear from the above that, so far as the colouration is concerned, the two forms are not conspecific. I have examined large numbers of fresh specimens of both kinds and am of opinion that Day's *savona* represents a new species which may be designated **Nemachilus dayi.**[1] *N. savona* (Ham. Buch.) may be redescribed as follows :—

D. 3/8 ; P. 9 ; V. 7 ; A. 2/5 ; C. 20.

Nemachilus savona is a small and slender species in which the body is pointed at both ends. The dorsal profile is slightly and gracefully arched, while the ventral profile is almost horizontal and straight throughout. The ventral surface is flattened, but the fish appears to be subcylindrical. The head is narrow and pointed ; its length is contained 5·5-5·8 times in the total length and 4·7 times in the length without the caudal. The width of the head is contained 1·5-1·6 times and the height at occiput 1·9-2·0 times in its length. The eyes are prominent, dorsolateral in position and not visible from the ventral surface ; they are situated almost wholly in the anterior half of the head. The diameter of the eye is contained 3-3·5 times in the length of the head, 1·5-1·7 times in the length of the snout and 1·6-1·8 times in the interorbital width. The interorbital space is flat or slightly convex. The mouth is inferior, transverse and semicircular ; it is bordered by fleshy lips which are fimbriated. The lips are continuous at the angles of the mouth, but the lower lip is interrupted in the middle and ends on both sides in fleshy, prominent areas. The upper jaw is produced in a beak-like process in the middle which projects in front of the lower jaw. The lower jaw has a plain sharp edge which is not notched. The three pairs of barbels are short and stumpy ; the outer rostral and the maxillary pairs are longer than the eye while the inner rostrals are as long as the eye.

The depth of the body varies considerably ; it is contained 7·1-11 times in the total length and 6-9 times in the length without the caudal. The body is covered with small, but well defined, scales which are more prominent in the posterior region. The ventral surface is smooth and devoid of scales. The lateral line is complete and runs in a groove along the middle of the body. The caudal peduncle is rather long ; its least height is contained 1·9-2 times in its length.

The dorsal fin is inserted in advance of the ventral and its commencement is invariably nearer to the tip of the snout than to the base of the caudal, but in some specimens it is equidistant. The longest ray of the dorsal fin is longer than the depth of the body below it. The outer edge of the fin is obliquely truncate. The paired fins are fan-like, horizontal and broadly pointed in the middle. The pectorals do not extend to the ventrals which are separated from the anal opening by a considerable distance. The anal fin, when laid flat, does not reach the base of the caudal which is emarginate and possesses rounded lobes.

A reference to the characteristic colouration of the species has already been made. In the large number of specimens before me, the dorsal and lateral surfaces of the head and body are dark-brown, the head being

[1] Specimens Nos. 89.2.1.1697-9 of the British Museum collection belong to this species They were collected by Day from the " N. W. Province." Both dorsal and caudal fins are spotted with numerous, irregular, dark spots.

darker than the body; while the ventral surface in front of the anal fin is pale-olivaceous, behind the anal it is marked with the bands descending from the sides. The body is marked with 9-10 narrow, yellowish bands which almost encircle the fish. Of these bands, there are 4[1] in front of the dorsal fin, 2 or 3 below it and 3 or 4 behind it. There is a vertical black mark at the base of the caudal fin which is of a somewhat grayish colour. The fins are usually devoid of any markings but in some specimens the caudal fin is provided with one or two V-shaped bands and the rays of the dorsal and anal fins are marked with black dots in the middle. The ventral surface of the head is irrorated with black dots which are also present along the edges of the ventral surface.

Distribution.—Hamilton collected specimens of *Nemachilus savona* in the Kosi River at Nathpur which used to be situated in the extreme north-east of the district of Bhagalpur (as delimited at present) and close to the boundary of Purnea. Large series of specimens have recently been collected from the foot of the Darjeeling Himalayas at Sevoke and Siliguri. It seems probable that this species has a wide range in the small, rapid and clear streams of the eastern sub-Himalayan region.

Measurements in millimetres.

Total length including caudal	33·0	32·0	32·0	31·0
Length of caudal	5·0	5·6	4·8	5·8
Depth of body	4·6	4·3	3·9	2·8
Length of head	6·0	5·6	5·6	5·3
Width of head	4·0	3·6	3·6	3·2
Height of head at occiput	3·0	2·9	2·7	2·6
Length of snout	2·0	1·7	1·7	1·5
Diameter of eye	1·2	1·0	1·0	1·0
Interorbital width	2·0	1·8	1·8	1·6
Longest ray of dorsal	5·0	5·0	5·0	5·0
Longest ray of anal	3·8	4·3	3·6	4·0
Length of pectoral	6·0	5·3	5·6	6·0
Length of ventral	5·4	4·2	4·8	4·6
Length of caudal peduncle	5·0	4·0	4·6	4·6
Least height of caudal peduncle	2·5	2·2	2·2	2·2
Distance between tip of snout and commencement of dorsal	12·6	13·1	12·6	12·0
Distance between commencement of pectoral and that of ventral	8·0	7·5	7·5	7·0

Nemachilus rupecola var. **inglisi,** nov.

(Plate III, figs. 9 and 10.)

1869: *Nemachilus rupecola,* Günther, *Cat. Fish. Brit. Mus.* VII, p. 351.

" *Schistura rupecula* " was described by McClelland[2] from " Mountain streams at Simla," and since then the species has been found to be widely

[1] In Hamilton's MS drawing the first band, which is situated immediately behind the head, is not shown but 9 bands in all are figured (3 predorsal, 2 subdorsal, 4 postdorsal).

[2] McClelland, *Journ. As. Soc. Bengal,* VII, p. 948, pl.lv, fig. 3 (1838); Ind. Cyprinidae, *As. Res.,* p. 309, pl. lvii, fig. 3 (1839).

distributed in the Western Himalayas. In the Eastern Himalayas, it is replaced by a form which, though very similar, is readily distinguished by certain well-marked characters.

Günther described *N. rupecola* from 5 specimens obtained in Sikkim, and an examination of these examples has shown that they are identical with hundreds of specimens collected at different places below Darjeeling. The most conspicuous feature of this form is, as has already been noticed by Günther, that the barbels are well developed and that there is a distinct nasal appendage. The last character has been considered of great taxonomic value by certain authors[1] in subdividing the vast assemblage of species grouped under the generic name *Nemachilus*, but I[2] have shown elsewhere that there are a number of species showing all possible gradations between the total absence and the presence of a distinct nasal barbel. Though this character is useful in distinguishing species within the genus, it cannot be used for separating closely allied forms into different genera.

In the typical *rupecola* of the Western Himalayas the nasal appendage is present, but is not so well marked and it seems desirable to separate the Darjeeling form into a distinct variety which I have the pleasure of associating with the name of Mr. C. M. Inglis, Curator of the Natural History Museum at Darjeeling. The new variety may be described as follows :—

D. 2/7 ; A. 1/5 ; P. 12 ; V. 8 ; C. 16.

Nemachilus rupecola inglisi is an elongated, stout muscular fish in which the dorsal profile is slightly arched, and the ventral profile is straight and horizontal throughout. The ventral surface in front of the anal opening is flattened and the paired fins are horizontally placed. The head is short and broad, being only slightly longer than broad. The length of the head is contained 4·5-5·1 times in the length without the caudal and the height of the body 5·2-7·1 times in the same dimensions. The eyes are dorso-lateral in position, are situated almost in the middle of the head and are not visible from the ventral surface. The nostrils are situated near the superior margin of the eye and are separated by a flap bearing a well-developed barbel. The mouth is semicircular and horizontal ; it is situated slightly behind the tip of the snout. The lips are fleshy and are continuous at the angles of the mouth ; the lower lip is interrupted in the middle. The upper jaw is produced into a beak-like process in the middle, while the lower jaw is notched in the corresponding position. All the barbels are longer than the diameter of the eye ; the inner rostrals are shorter than the other two pairs. The gill-openings are mostly restricted to the sides.

The body is covered with small, indistinct scales which are embedded in the skin. The lateral line is complete. The ventral surface appears to be totally devoid of scales. The caudal peduncle is deep and stout ; its least height is contained 1·1–1·3 times in its length.

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[1] Jordan and Fowler, *Proc. U. S. Nat. Mus.* XXVI, p. 768 (1903) ; Weber and Beaufort, *Fish Indo-Austral. Archipel.* III, p. 35 (1916).

[2] Hora, *Rec. Ind. Mus.* XXXI, p. 312 (1929).

The dorsal fin is inserted opposite the ventrals, and its commencement is nearer to the base of the caudal than to the tip of the snout. The longest ray of the dorsal is shorter than the depth of the body. The anterior margin of the fin is rounded. The pectoral fin is shorter than the head, and is separated from the ventral by a considerable distance. The ventral fins which are similar to the pectorals, are broad and rounded, and do not extend as far as the anal-opening, which is situated at a distance equal to the diameter of the eye from the commencement of the anal fin. The anal fin is separated from the caudal by a considerable distance. The caudal fin is almost as long as or somewhat shorter than the head; it is either truncate or slightly bilobate with the lobes rounded.

The body is marked with 14 to 16 vertical bands which are broader than the interspaces between them. A black spot is usually present at the base of the anterior dorsal rays, and generally there are short, dark streaks on the outer rays of the dorsal and caudal fins. The arrangement and the number of colour bands varies considerably and in some young examples they are absent altogether. The dorsal surface of the head is marked with closely set black spots.

Type-specimen.—F $\frac{11755}{1}$, *Zoological Survey of India, Indian Museum, Calcutta.*

Locality.—Eastern Himalayas, rivers below Darjeeling and in Sikkim.

Remarks.—The variety *inglisi* differs from the typical *rupecola* in the possession of a distinct nasal barbel, relatively smaller fins and in its stouter built. The position, form and structure of its paired fins indicate that this variety is better adapted for life in rapid currents than the typical form. The outer rays of the paired fins are provided with adhesive pads on the ventral surface.

Measurements in millimetres.

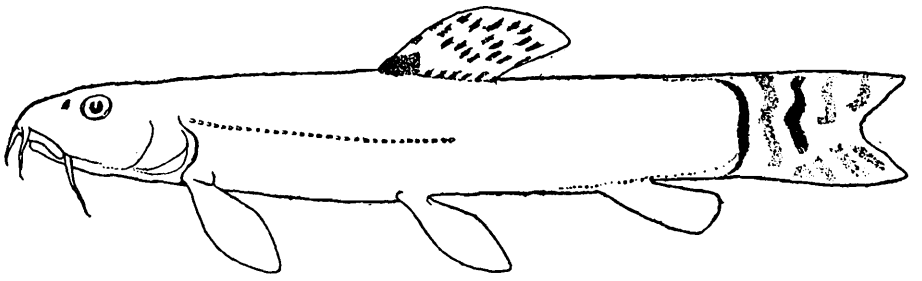
Total length including caudal	68·5	58·0	66·5	83·5	80·2	93·3	88·5	70·0
Length of caudal	9·3	10·0	9·2	13·8	11·8	13·0	12·1	10·5
Length of head	12·3	10·5	11·3	13·6	13·2	15·8	15·8	12·3
Greatest depth of body	10·0	8·0	11·0	11·2	10·2	11·2	11·5	9·0
Length of snout	5·8	4·5	5·0	6·2	6·5	7·8	7·2	5·6
Interorbital distance	5·4	4·2	5·0	6·0	5·8	6·3	6·2	4·5
Length of caudal peduncle	9·2	7·3	8·2	10·2	9·5	12·3	10·0	7·7
Least height of caudal peduncle	8·2	6·0	7·2	9·2	8·7	8·4	9·0	7·0
Longest ray of dorsal	8·5	7·5	9·0	10·5	9·8	10·8	10·8	8·2
Length of pectoral	11·0	10·0	11·2	14·3	13·0	14·0	13·8	11·0
Length of ventral	10·2	9·2	10·3	13·8	12·4	13·0	12·4	9·8
Longest ray of anal	7·0	7·2	7·3	9·8	9·0	10·5	10·8	8·2
Distance between tip of snout and commencement of dorsal.	32·0	26·2	30·2	36·3	36·0	41·6	41·0	32·0
Distance between commencement of pectoral and that of ventral.	20·0	16·5	19·8	21·0	21·3	25·0	24·0	18·5
Distance between tip of snout and anal opening.	44·0	36·8	43·0	50·6	49·8	57·0	56·2	42·4

Nemachilus multifasciatus Day.

1878. *Nemachilus multifasciatus*, Day, *Fish. Ind.*, p. 617, pl. cliii, fig. 7.
1889. *Nemachilus multifasciatus*, Day, *Faun. Brit. Ind. Fish.* I, p. 231.

Nemachilus multifasciatus, which was described by Day from "Darjeeling and Assam", has never been collected again from these places. The Burmese and Siamese specimens reported under this name[1] are not conspecific with the Indian species and I propose for these the name *Nemachilus vinciguerrae*, sp. nov. (*vide* p. 62).

With the original description, Day figured a specimen from Darjeeling which is preserved in the collection of the Zoological Survey of India, but is unfortunately not in a fit condition for taxonomic purposes. Mr. J. R. Norman has sent me for study Day's specimen of the species from Assam (No. 89.2.1.1669), and it is now clear that the species has to be regarded as valid, it is distinguished by the colour-markings on the dorsal and caudal fins. Day, describes the colouration as follows; "vertical bands as wide as the ground colour, pass from the back to the lower surface of the abdomen, those between the head and the dorsal fin are numerous, while there are about five posterior to it. In some examples these anterior bands coalesce. A dark band at the base of the caudal and dark marks on the head radiating from the eye. *Fins yellow, the dorsal with four bands of spots and an equal number or more on the caudal. Ventrals and anal with two bands each*" (Italics are mine). Hitherto, more attention has been paid to the markings of the body, but I have indicated that in two other Eastern Himalayan species—*N. beavani* and *N. scaturigina*—the bands in front of the dorsal break up resulting in numerous bands as described by Day for his *multifasciatus*. This feature is also characteristic of *N. vinciguerrae*. The chief distinguishing feature of *N. multifasciatus* lies in the fact that the dorsal and caudal fins are provided with many rows of spots which are sometimes irregularly distributed. The only other species, which shows this character, is Day's *savona* for which I have proposed the name *dayi* (*vide* p. 57). The two species can be readily distinguished by the colouration of the body—narrow, yellowish inter-spaces between bands in *dayi* and wide, pale interspaces between bands in *multifasciatus*.



TEXT-FIG. 1.—Lateral view of a typical specimen of *Nemachilus multifasciatus* Day from Assam, showing the colour pattern on the dorsal and caudal fins. ×1⅔. (Brit. Mus. No. 89.2.1.1669).

[1] Vinciguerra, *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 209 (1890); Mukerji, *Journ. Bombay Nat. Hist. Soc.* XXXVII, p. 43 (1934); Hora and Mukerji, *Rec. Ind. Mus.* XXXVI, p. 135 (1934).

Day included McClelland's *subfusca* with a query in the synonymy of his *multifasciatus*, but assigned Günther's *montanus*[1] (*nec* McClelland) definitely to its synonymy. I have discussed the specific identity of *subfusca* in another place (*vide* p. 65) and shown that it is synonymous with *N. scaturigina*. In Günther's *N. montanus* the dorsal and caudal fins are provided with a single row of spots, so it is not conspecific with *multifasciatus*. I have examined the two specimens of Günther's *montanus* in the British Museum and am of opinion that they do not belong to McClelland's *montanus* from the Simla Hills.

In the Assamese specimen of *N. multifasciatus*, the ventrals do not reach the anal opening; the lateral line is incomplete,[2] extending only as far as the commencement of the ventral; scales are minute but fairly distinct; the upper jaw is produced into a prominent beak in the middle and the lower jaw is emarginate to receive this prominence. As the specimen is flabby, no reliance can be placed on the measurements of its various parts. The colouration of the body is faded, but the rows of spots on the dorsal and caudal fins are fairly distinct.

Nemachilus vinciguerrae, sp. nov.

(Plate III, fig. 12.)

1890. *Nemachilus multifasciatus*, Vinciguerra (*nec* Day), *Ann. Mus. Civ. Stor. Nat. Genova* (2) IX, p. 209.
1834. *Nemachilus multifasciatus*, Mukerji (*nec* Day), *Journ. Bombay Nat. Hist. Soc.* XXXVII, p. 43.
1934. *Nemachilus multifasciatus*, Hora & Mukerji (*nec* Day), *Rec. Ind. Mus.* XXXVI, p. 135.

In my[3] revision of the fishes of the genus *Nemachilus* from Burma, it was indicated that Vinciguerra's *N. multifasciatus* may be a new species, but as the precise specific characters of Day's *N. multifasciatus* were not known, it was decided not to deal with the species. Recently, Mukerji described Burmese and Siamese material which he referred to *multifasciatus* (*sensu lato*). Mukerji and I identified a specimen from the S. Shan States as *N. multifasciatus* as recognised by Vinciguerra. Having now examined a tolerably good specimen of Day's *multifasciatus*, I am in a position to refer the Burmese and Siamese specimens to a distinct species for which I propose the name *N. vinciguerrae*. A full description of this species has already been published by Mukerji, and only a few necessary notes are added here to supplement his account. The body is marked with a number of vertical bands which, in some specimens, break up anteriorly. The dorsal surface and sides of the head are covered with short, black markings. In the middle of the base of the caudal fin, there is a well-marked, short, prominent, vertical band. The dorsal fin has one, sometimes two, series of spots; the caudal fin has two V-shaped bands and the ventral and anal fins with one band each. The body is slender. The lateral line is complete. The scales are better developed than in *N. multifasciatus*. The beak of the upper jaw is not so prominent as in *N. multifasciatus*.

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[1] Günther, *Cat. Fish Brit. Mus.* VII, p. 350 (1868).
[2] According to Day, the lateral line is complete in *N. multifasciatus*.
[3] Hora, *Rec. Ind. Mus.* XXXI, p. 314 (1929).

Type-specimen.—F. $\frac{11754}{1}$, *Zoological Survey of India, Indian Museum, Calcutta.*

Nemachilus beavani Günther.

(Plate III, fig. 11.)

1868. *Nemachilus beavani*, Günther, *Cat. Fish Brit. Mus.* VII, p. 350.
1877. *Nemachilus beavani*, Beavan, *Freshwater Fish India*, p. 107.
1924. *Nemachilus* sp., Hora, *Rec. Ind. Mus.*, p. 28, fig. 1.

The species was described from a single specimen, two inches long, collected by Lieut. R. C. Beavan from the " Kossye River," but no figure of it has so far been published. Day[1] referred specimens from the Bhavani River to this species and regarded his *Nemachilus chryseus*[2] as a synonym of *N. beavani*, which, according to him, is found in " Bowany in Madras and Mysore, also Orissa." Day's *N. beavani* is probably conspecific with *N. denisonii* Day, a very variable species as regards its colouration, but I have no doubt, that it is not the same as Günther's *beavani*.

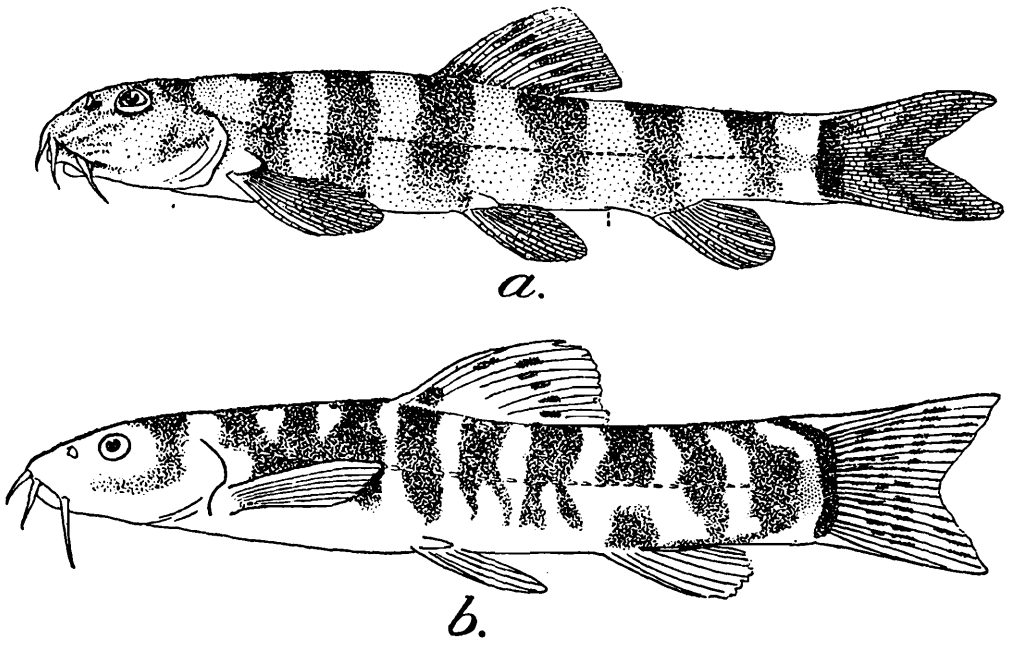
Recently, Fowler[3] assigned a large series of specimens from the headwaters of the Sutlej and Beas Rivers to *N. beavani* and gave a short description of his specimens. Unfortunately he has made no observations on colouration. According to him, the species is characterised " by its broad or depressed head and well-developed rudimentary caudal rays." In the collection of the Zoological Survey of India, there are half a dozen specimens received in exchange from the Academy of Natural Sciences, Philadelphia, and determined by Dr. H. W Fowler as *N. beavani*. The colour is faded. From their general facies and form of the caudal fin, they can be readily distinguished from Günther's *beavani* in which the head is not so depressed and the snout is obtusely pointed. I shall discuss the identity of Fowler's *beavani* in my account of the Nemachili from the Western Himalayas.

In 1924, I described specimens of *Nemachilus* from the Garo Hills in Assam, but was unable to assign them to any species. Recently a large number of similar specimens have been collected in the small streams below Darjeeling and while identifying them, it was found necessary to investigate the precise specific limits of *N. beavani*. The matter was referred to Mr. J. R. Norman of the British Museum who sent me a sketch of the type-specimen of Günther's species. The drawing, which is reproduced here, leaves no doubt that my Garo Hills and Darjeeling specimens have to be referred to *N. beavani*. As a fairly complete description of the species has already been published (Hora, 1926) a few notes are given here regarding variation in its colouration.

The characteristic feature of the species is that the vertical bands are broad and fewer in number. The dark band at the base of the caudal fin is broad and conspicuous, though in the type-specimen it is somewhat narrower. In certain specimens the bands, especially those

[1] Day, *Fish. India*, p. 620, pl. clvi, fig. 8 (1878).
[2] Day, *Journ. Linn. Soc. London* (Zool.) XI, p. 529 (1873).
[3] Fowler, *Proc. Acad. Nat. Sci. Philadelphia* LXXVI, p. 71 (1924).

anterior to the dorsal fin, break up and form numerous narrow bands as has already been figured in the case of the Garro Hills specimens.



TEXT-FIG. 2.—Lateral view of *Nemachilus beavani* Günther. ×2.
a. Fresh specimen from the Darjeeling Himalayas.
b. Sketch* of the type-specimen in the British Museum.
* In sending the sketch, Mr. J. R. Norman observed that " Markings are very faded and indistinct—with exception of dark band across base of caudal and dark spots on rays of dorsal fin."

Nemachilus beavani is fairly abundant in small streams at the base of Eastern Himalayas. In specimens obtained from very fast currents, there is invariably a well-developed fleshy appendage in the axil of the pectoral fin. The ventral fins are also provided with fleshy appendages.

Nemachilus scaturigina (McClelland).

(Plate III, figs. 7-8.)

1839. *Cobitis* (*Schistura*) *scaturigina*, McClelland, *As. Res.* (Ind. Cyprinidae, XIX, pp. 308, 443, pl. liii, fig. 6.
1839. *Cobitis* (*Schistura*) *subfusca*, McClelland, *ibid.*, p. 308, 443, pl. liii, fig. 5.
1846. *Cobitis subfusca*, Cuvier & Valenciennes, *Hist. Nat. Poiss.* XVIII, p. 80.
1854. *Cobitis scaturigina*, Bleeker, *Verh. Bat. Gen.* XXV, p. 70 (name only).
1854. *Cobitis subfusca*, Bleeker, *ibid.*, p. 70 (name only).
1868. *Nemachilus subfuscus*, Günther, *Cat. Fish Brit. Mus.*, VII, p. 351.
1868. *Cobitis scaturigina*, Günther, *ibid.*, p. 347 (foot-note).
1877. *Nemachilus subfuscus*, Beavan, *Freshwater Fish Ind.*, p. 108.
1878. *Cobitis scaturigina*, Day, *Fish India*, p. 614 (reference under *Nemachilus botia*).

Nemachilus scaturigina was described by McClelland in his account of the Indian Cyprinidae, but he assigned the authorship to Hamilton-Buchanan under a misapprehension. The species was described from a figure in the Royal Botanical Garden at Calcutta and McClelland remarked that " This species is also without suborbital spines, and in my opinion is nearly allied to S. subfusca ; the ventrals are, however, round, and the rays of the dorsal are marked on the middle with a brown spot. I cannot find this species referred to in the *Gangetic Fishes*, though

it is figured in Buchanan's collection." It is now well-known that Hamilton left behind in India drawings of 144 species of fish and 13 years later when McClelland examined them there were 150 drawings. There is no doubt, therefore, that 6 of these drawings did not belong to Hamilton's collection and had been added to it later, possibly by Wallich. I have shown elsewhere[1] that one of these six drawings is *Cobitis scaturigina*, to which there is no reference even in Hamilton's 'Original Notes' concerning the "Gangetic Fishes."

McClelland found the drawing labelled as "*Cobitis scaturigina*" and adopted this name for the species. The drawing is still preserved among Hamilton's collection of drawings in the Library of the Asiatic Society of Bengal (No. 53 of Volume IV), but unfortunately it bears no name and it is difficult, therefore, to decide about the actual authorship of the name. Day[2] did not find the name on the plate when he examined these illustrations in 1871. In view of these circumstances and the fact that McClelland introduced this species in scientific literature with a distinct indication, the authorship of the species should be assigned to him.

McClelland regarded *Cobitis scaturigina* as a close ally of his *C. subfusca* from "Upper Assam" and his figures of the two species indicate close similarity. From a study of the large material obtained at the base of the Darjeeling Himalayas, I find that the two forms are identical, though they represent colour variations in the same species, I have adopted the name *scaturigina* in preference to *subfusca* for the simple reason that the former is characterised before[3] the latter in McClelland's work (p. 308).

Between 1815, when Hamilton left India, and 1838, when McClelland examined Hamilton's collection of fish drawings, it is known that Wallich and Hardwicke used this collection extensively and had copies made of some of the drawings. It is also known that both Wallich and Hardwicke had drawings made of species not represented in Hamilton's collection, and further it is known that both these workers paid frequent visits to the Darjeeling Himalayas and made collections of fish there. Whereas Hardwicke's illustrations were published by Gray,[4] it is likely that drawings made by Wallich were kept mixed up with Hamilton's collection. I presume that the drawing of *Cobitis scaturigina* belonged to Wallich and was executed from a specimen collected below Darjeeling Himalayas. If this be so, the specimens obtained at Sevoke and other places represent topotypes of the species.

Both *scaturigina* and *subfusca* had a chequered career and their specific identity has not been elucidated so far. Cuvier and Valenciennes and Bleeker described them from McClelland's brief descriptions and figures. Günther regarded *scaturigina* as a doubtful species and gave a brief description of *subfusca* after McClelland. According to Day, "The *Cobitis scaturigina* McClell. is an elongated variety of *Nemachilus botia*, the height of the body being about $6\frac{1}{2}$ in the total. I have obtained

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[1] Hora, *Mem. Ind. Mus.* IX, p. 173 (1929).
[2] Day, *Proc. As. Soc. Bengal*, p. 202 (1871).
[3] The order of precedence is changed on page 443, but this is immaterial.
[4] Gray, *Illustrations of Indian Zoology*, 2 vols. (London: 1832).

it in Assam." It is impossible to say how Day came to this conclusion for there is not the least likeness between the figures of *scaturigina* and *N. botia*. The general facies, the colouration and the form of the caudal fin are absolutely different in the two species. *Schistura subfusca* was included by Day with a query in the synonymy of his *Nemachilus multifasciatus* which was described from Darjeeling and Assam. It is shown here that *N. multifasciatus* is a very characteristic species distinguished by the colouration of the dorsal and caudal fins and is quite distinct from McClelland's species.

In the collection of the British Museum, there are five specimens (No. 72.4.17.32), collected in North-east Bengal by Dr. T. C. Jerdon, labelled as *N. scaturigina*. This seems to be a mixed lot as the two specimens loaned to me for examination from the British Museum belong to two species—*N. scaturigina* and *N. beavani*. Though the colour is very much faded, the two species can be readily distinguished by the position of the anus with reference to the ventral fins.

In view of the great confusion prevailing about the specific limits of *N. scaturigina*, it may be redescribed as follows :—

D. 2/7 ; A. 2/5 ; P. 10 ; V. 8 ; C. 19.

Nemachilus scaturigina is a small, elongated species in which both the dorsal and the ventral profiles are almost straight and horizontal. The ventral surface is somewhat flattened in front of the ventral fins. The head is long, narrow and pointed anteriorly ; its length is contained 4·2-4·5 times in the total length without the caudal. The width of the head is contained 1·4-1·6 times and the height of the head 1·6-1·8 times in its length. The snout is somewhat longer than the postorbital part of the head. The eyes are dorso-lateral in position and are not visible from the ventral surface. The diameter of the eye is contained 4-5·3 times in the length of the head ; 1·6-2·2 times in the length of the snout and is almost equal to or is contained up to 1·4 times in the interorbital width. The mouth is small, semicircular and horizontal ; it is situated on the ventral surface behind the tip of the snout and is bordered by fleshy lips. The lower lip is interrupted and reflected towards the sides in the middle. The lips are plain without corrugations, but they may be slightly crenulated. The lower jaw is sharp and shovel-like and the upper jaw is vertical and lies in front of the lower jaw. In the male specimens, there is a fleshy, loose pad below the eye and the upper surface of the anterior pectoral rays is tuberculated. All the three pairs of barbels are longer than the eye, but the outer rostral barbels are the longest.

The body is narrow and elongated ; its depth is contained from 5·4 to 6·5 times in the total length without the caudal. It is covered with small, inconspicuous scales which are somewhat more prominent in the tail region and are absent from the ventral surface. The lateral line is complete, and runs in a narrow groove along the middle of the body. The caudal peduncle is short and high ; its least height is contained 1·1-1·5 times in its length.

The dorsal fin begins in advance of the ventrals and its commencement is almost equidistant between the tip of the snout and the base

of the caudal fin ; its anterior margin is slightly rounded but the posterior margin is obliquely truncate. The longest ray of the dorsal is usually longer than the depth of the body below it. The paired fins are horizontally placed and pointed in the middle. In the mature males, the first two rays are broad and elongated, while a number of the outer rays are provided with tubercles on the dorsal surface. The pectoral fin is separated from the ventral by a considerable distance. The ventral fin does not reach the anal opening. The caudal fin is emarginate with both the lobes pointed.

In spirit specimens the head and body are grayish above and pale-olivaceous below. There are about 9 to 12 saddle-shaped, narrow, dark bands which descend on the sides from the dorsal surface, but do not extend to the ventral surface. In some specimens, the bands are interrupted, so they appear as series of blotches irregularly distributed. Sometimes the bands are split up into secondary bands. This condition becomes more pronounced in front of the dorsal fin and in extreme cases results in the *multifasciatus*-type of colouration. There is a narrow black bar at the base of the caudal fin and one or two series of dots forming a V-shaped pattern on the fin itself. The rays of the dorsal fin are also infuscated in the middle. There is a black spot at the base of the anterior dorsal rays.

Distribution.—Eastern Himalayas and Assam. Most of the specimens in the collection of the Zoological Survey of India were obtained from small streams at the base of the Darjeeling Himalayas. *N. scaturigina* is not as common as *N. rupecola* var. *inglisi*, *N. savona* or *N. devdevi*.

Measurements in millimetres.

Total length without caudal	41·0	43·3	44·6	42·5
Length of caudal	11·0	11·3	12·0	Damaged.
Depth of body	6·3	8·0	7·5	7·0
Length of head	9·5	9·8	9·8	10·0
Width of head	6·0	6·7	6·7	6·0
Height of head at occiput	5·3	6·0	5·8	5·3
Length of snout	4·0	4·0	4·0	3·6
Diameter of eye	1·8	2·2	2·5	2·0
Interorbital width	2·6	2·4	2·5	2·5
Longest ray of dorsal	8·6	7·3	8·0	8·3
Longest ray of anal	6·5	7·0	8·0	6·5
Length of pectoral	9·8	10·0	11·0	9·0
Length of ventral	7·0	7·6	7·0	7·0
Length of caudal peduncle	6·0	7·0	6·8	6·0
Least height of caudal peduncle	4·7	4·5	5·5	5·6
Distance between tip of snout and commencement of dorsal	21·2	22·0	22·0	21·5
Distance between commencement of pectoral and that of ventral	13·0	13·0	13·5	13·0