A NOTE ON THE FISHES FROM THE HELMUND RIVER IN AFGHANISTAN, WITH THE DESCRIPTION OF A NEW LOACH.

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The Zoological Survey of India is much indebted to Prof. S. Ali Akhtar of the Faculty of Medicine, Kabul, for the very valuable and interesting collection of fishes from Afghanistan which he kindly presented to the Survey along with his ecological notes. The scientific importance and significance of the collection lie not only in the funistic peculiarities but also in the elucidation of zoo-geographical features and affinities of the area.

The physical features and historical sketch of parts of Afghanistan have been described by McClelland[1], Annandale[2], and Hora[3]. For the sake of convenience the former workers on the fauna of Afghanistan divided the country into three systems based on the course of the three main rivers *viz.*, the Oxus in the North, Helmund in the South and Kabul river dividing the former two water-sheds. It is noteworthy, however, that each of these systems has its own indegenous fish fauna, except for a few forms which have a wider range of distribution.

A study of the present collection of fishes from the Helmund river reveals the presence of 4 species *viz.*, *Oreinus sinuatus* var. *griffithii* McClelland, *Schizothorax labiatus* (McClelland), *Schizopygopsis stoliczkae* Steindachner and a new species of *Nemachilus*.

Oreinus sinuatus var. **griffithii** McClelland.

1842. *Oreinus griffithii*, McClelland, *Calcutta J. Nat. Hist.* II, p. 581.
1842. *Oreinus maculatus*, McClelland, *ibid.*, p. 580.
1868. *Oreinus griffithii*, Günther, *Cat. Fish. Brit. Mus.* VII, p. 160.
1868. *Oreinus sinuatus*, Günther, (in part) *ibid.*, p. 161.
1889. *Oreinus sinuatus*, Day, *Faun. Brit. India*, Fish. I, p. 248.
1933. *Oreinus sinuatus* var. *griffithii*, Hora, *J. Bombay Nat. Hist. Soc.* XXXVI, p. 700.
1934. *Oreinus sinuatus* var. *griffithii*, Hora, *ibid.*, XXXVII, p. 794.
1934. *Oreinus sinuatus* var. *griffithii*, Hora, *Rec. Ind. Mus.* XXXVI, p. 300.
1936. *Oreinus sinuatus*, Mukherji, *Mem. Conn. Acad.* X, *Art.* xviii, p. 347.

In the collection this species is represented by 80 specimens ranging in length from 12·4 to 23·5 cms. Eventhough the specimens show individual variations, the diaganostic features of most of them are quite the same as described by Hora[4]. A few specimens, however, differ from the typical forms and they seem to be hybrids between *Oreinus sinuatus* var. *griffithii* and *Schizothorax labiatus*, as already pointed out by Hora[5]

[1]McClelland, J., *Calcutta J. Nat. Hist.* II, pp. 560—573 (1842).
[2]Annandale, N., *Rec. Ind. Mus.* XVIII, pp. 3—16 (1919).
[3]Hora, S. L., *J. Bombay Nat. Hist. Soc.* XXXVI, pp. 688—691 (1933).
[4]Hora, S. L., *Rec. Ind. Mus.* XXXVI, p. 303 (1934).
[5]Hora, S. L. *ibid.*, p. 307 (1934).

and Mukerji[1]. The character gradients of these forms are enumerated in the following table :—

	Schizothorax labiatus	*Oreinus sinuatus* var. *griffithii*	Intermediate forms
Shape of head.	Long and pointed.	Short, broad and broadly pointed.	Various gradations from the former to the latter.
Shape of mouth opening.	Horse-shoe shaped.	Transverse and more or less straight.	In most cases arched but not so much as in *Schizothorax* mouth. Gradations from the former to the latter can be easily made out.
Posterior lip.	Smooth, trilobate, round and broad.	Posterior half conspicuosly papillated from end to end, transverse and straight.	Gradations occur from distinguishably papillated to sparsely papillated only in the middle of the lower lip. The posterior margin of the lower lip also varies in shape from straight to curved.

Any way, in these specimens, the *Oreinus* characters are more predominant than the *Schizothorax* features.

This species was originally described by Hora[2] from the Chitral river in the Oxus river system and later from the Kabul river and its tributary streams. But this is the first time that *Oreinus sinuatus* var. *griffithii* is being recorded from the Helmund river system.

Locality.—Farakhollum, about 10 miles South of Gardan Diwar.

Schizothorax labiatus (McClelland).

1842. *Racoma labiatus*, McClelland, *Calcutta J. Nat. Hist.* II, p. 578.
1842. *Schizothorax ritchieana*, McClelland, *ibid.*, p. 580.
1868. *Racoma labiatus* Günther, *Cat. Fish. Brit. Mus.* VII, p. 162.
1877. *Schizothorax ritchianus*, Day, *Fish. India*, p. 531 (Foot Note).
1877. *Schizothorax labiatus*, Day, *ibid.*, p. 532 (Foot Note).
1934. *Schizothorax labiatus*, Hora, *Rec. Ind. Mus.* XXXVI, p. 292.
1936. *Schizothorax labiatus*, Mukerji, *Mem. Conn. Acad.* X, *Art.* xviii, p. 333.

In the collection under report, there is only a single specimen of this species measuring 18·6 cm. in total length. The specific characters of this species are well marked in this single specimen. So there is no doubt about its identity.

In the specimen the lower lip is slightly striated which, however, is only a gradation from the soft to the highly papillated variation already noted by Hora *op.cit.* in this species.

Locality.—Farakhollum, about 10 miles South of Gardan Diwar.

Schizopygopsis stoliczkae Steindachner.

1866. *Schizopygopsis stoliczkae*, Steindachner, *Verh. Zool-Bot. Ges. Wien* XVI, p. 786, pl. xvi, fig. 2.
1868. *Schizopygopsis stoliczkae*, Günther, *Cat. Fish. Brit. Mus.* VII, p. 170.
1876. *Schizopygopsis stoliczkae*, Day, *Proc. Zool Soc. London*, p. 791.
1878. *Schizopygopsis stoliczkae*, Day, *Fish. India*, p. 531, pl. cxxiv.
1889. *Schizopygopsis stoliczkae*, Day, *Faun. Brit. India*, Fish. I, p. 251. fig. 89.
1911. *Schizopygopsis stoliczkae*, Stewart, (in part), *Rec. Ind. Mus.* VI, p. 73, pl. iii, figs. 1—3.
1916. *Schizopygopsis stoliczkae*, Berg, *Poiss. des Eaux Douces de Russie*, p. 290.
1920. *Schizopygopsis stoliczkae*, Annandale & Hora, *Rec. Ind. Mus.* XVIII, p. 173. fig. 7.
1935. *Schizopygopsis stoliczkae*, Hora & Mukerji, *in Visser's Karakorum.* I, p. 434, pl. iii, figs. 1—4.
1936. *Schizopygopsis stoliczkae*, Mukerji, *Mem. Conn. Acad.* X, *Art.* xviii, p. 351.

[1]Mukerji, D. D., *Mem. Conn. Acad.* X, *Art.* xviii, p. 350 (1936).
[2]Hora, S. L., *Rec. Ind. Mus.* XXXVI, p. 306 (1934).

The two specimens available in this collection are very small and measure 41·0 and 42·5 mm. without the caudal fin. Since these two specimens are not in a good state of preservation, many of its morphological characters could not be studied in detail.

Annandale and Hora *op.cit.*, who had recorded the species from Seistan, made the following interesting remark in their description of the species—

"The two types of head referred to by Stewart (*op. cit.*) as the *stoliczkae* and the *sevewzovi* type are both found, without intermediates, in our series, but the former occurs only in two specimens and is not correlated with differences in proportions."

And so they concluded that :

"We do not, therefore, consider it advisable to give the Seistan fish a racial name".

An examination of the two specimens in the present collection shows that the characters of the two species mentioned by Stewart *op.cit.*, are not of any racial value.

Again, a comparative study of the anterior part of the two specimens with the description and figures by Hora and Mukerji *op.cit.* shows, that these two have more resemblance to typical *stoliczkae* rather than to the Seistan forms.

This probably supports Stewart's (*op. cit.*) view that :

" It is not justifiable to separate *Schizopygopsis severzovi* from *S. stoliczkae* as a distinct species, since they can only be distinguished by one character and a complete series of gradations occur from the one extreme type of head to the other. The fish from any single narrow locality appear to incline to one type or the other."

Locality.—Water channel 8 miles East of Labi Baring, Seistan.

Thus the variation in the shape and form of head of this species correlated with the variation of the same parts noted in the new species of loach (*vide infra*) received from the Helmund river, probably throws some light on the effect of climate and environmental conditions on the fauna of the particular region.

Nemachilus akhtari, sp. nov.

D. 2/7 ; A. 1/6 ; P. 1/10 ; V. 2/7 ; C. 16+.

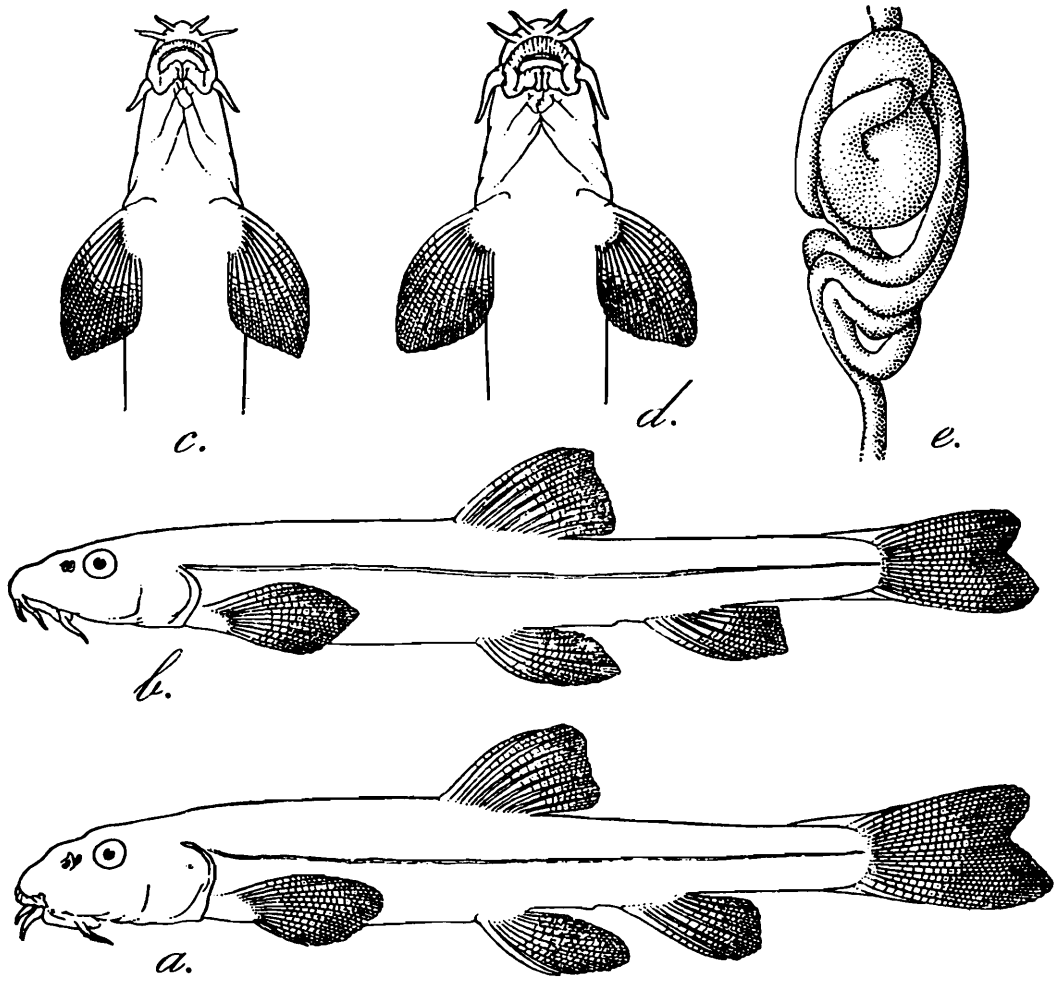
Various authors have recorded a number of species and varieties of *Nemachilus* from the Helmund river basin. But in the present collection there is a species of *Nemachilus* which shows characters that, to my knowledge, have not been described so far in any one of them. I propose to recognize it as a new species and describe it as *Nemachilus akhtari.*

Nemachilus akhtari is a long and slender fish in which the head and anterior part of the body are depressed, while the tail region, though compressed, is not whip-like. The dorsal profile is slightly arched and the ventral profile is almost horizontal throughout, except in gravid females in which the abdominal region is somewhat convex. The present

collection contains specimens in which the head is broadly pointed and others in which the head tapers rather evenly (Text-fig. 1. *c* & *d*). These differences in the shape of the head are not correlated with differences in sex.

The length of the head is contained from 5·3-5·6 times in the total length and from 4·4-5·0 times in the length without the caudal. The width of the head is contained from 1·3-1·6 times and its height at occiput from 1·8-2·1 times in its length.

In most of the specimens, the eye is situated slightly towards the tip of snout and in a few in the middle of the head. The diameter of the eye is contained from 5·0-6·3 times in the length of the head, from 2·0-2·7 times in the length of snout and from 1·2 -1·7 times in the inter-orbital width. The eyes are not visible from the ventral surface.



TEXT-FIG. 1.—*Nemachilus akhtari*, sp. nov. *a* & *b*. Lateral views showing the difference in the shape of the head :× 1½. *c*. & *d*. Ventral views of *b* & *a* showing the mouth parts :× 1½. *e*. Alimentary canal :× 2.

The mouth is inferior, crescentic and situated slightly behind the tip of snout. The posterior lip is reflected backwards so that a fairly large portion of the jaw is left uncovered. The lips are thick, continuous at the angles of the mouth, and greatly striated. The post-labial groove is very narrow and, on either side of the groove, the ridges are prominently enlarged and elongated and extend backwards as two separate ridges. This is very characteristic of the species. The maxillary and outer rostral pairs of barbels are of the same length and are longer than the diameter of the eye. The inner rostral barbels are short and stumpy.

The greatest height of the body below the dorsal fin is contained from 8·6-9·8 times in the total length and from 7·0-8·3 times in the length without the caudal. The body is scaleless and smooth. The lateral line is complete. The caudal peduncle is long and narrow ; its least height is contained from 2·4-2·9 times in its length.

The dorsal fin commences midway between the tip of the snout and the base of the caudal and is inserted slightly in advance of the pelvics. The height of the dorsal fin is almost equal or slightly higher than the depth of the body just below it. Its anterior margin is rounded near the tip and the free posterior border is almost straight or slightly concave. The paired fins are horizontally placed ; they are broad and more or less triangular in shape. The pectoral fin is shorter than the head and extends half the way to the pelvic. In all the specimens the pelvic fin extends beyond the anal opening. In many cases the pelvics do not reach, while in some specimens they just touch the anal fin. In a few cases, however, the pelvics extend beyond the commencement of the anal fin. The anal fin resembles the dorsal fin in form and is separated from the caudal by a distance greater than its own length. Anal fin has a broad base. The caudal fin is almost as long as or slightly shorter than the head. It is slightly emarginate, the lower lobe being better developed and longer than the upper.

Nemachilus akhtari shows sexual dimorphism. The differences noted are similar to the secondary sexual characters described by Hora for *N. tibetanus*[1], *N. choprai*[2], and *N. kashmirensis*[3]. But they are not so well marked. Sex cannot be differentiated by the difference in the shape of head or the length of pelvic fin.

The present collection of specimens is several years old and hence the original colouration has faded away in spirit. It is, however, noted that the colouration slightly varies with size and age of the specimen. In all the specimens, the dorsal surface and the sides of the body are darker and towards the ventral surface, pale yellow in colour. On the dorsal surface, there are numerous black bands, which in the caudal region, are five in number. The dorsal and caudal fins are spotted with black while the paired and the anal fins are pale yellow.

Bionomics.—The greatly reduced air bladder enclosed in a bony capsule, the flattended ventral surface, the horizontally placed paired fins, and the well developed lower lobe of caudal fin of *Nemachilus akhtari* indicate the bottom-dwelling nature of the fish. Besides, the unusually developed lips and the highly convoluted alimentary canal[4] with the intestines full of sand and gravel show the ground and herbivorous habit of life. Rarely, the coils of the alimentary canal exhibit still further complications and coils.

Locality.—Farakhollum, about 10 miles South of Gardan Diwar, Helmund river.

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[1] Hora, S. L. *Rec. Ind. Mus.* XXIV, p. 81 (1922).
[2] Hora, S. L., *ibid.*, XXXVI, p. 313 (1934).
[3] Hora, S. L., *ibid.*, XXXVI, p. 318 (1934).
[4] In the convolutions and the position in which the coils of the alimentary canal lie this specie shows some resemblance to *Nemachilus dorsonatus* Kessl., described and figured by Herzenstein in " *Wiss Res. Prezewalski Central As. Reis. Zool.*" III(2), Tab. viii figs. 14—18, (1888).

Measurements in millimeters.

	♂	♀	♂	♂	♀	♀
Total length including caudal ..	118·0	112·0	112·0	108·0	104·0	100·0
Length without caudal	99·0	92·5	92·0	91·5	84·0	84·0
Length of head	22·0	21·0	20·0	18·0	19·0	18·0
Width of head	13·5	14·0	13·0	12·0	13·0	13·0
Height of head	10·5	10·0	10·0	10·0	10·0	9·5
Depth of body	13·0	13·0	12·0	11·0	12·0	11·0
Length of snout	9·5	9·0	8·0	8·0	9·0	7·0
Diameter of eye	3·5	4·0	4·0	3·0	3·5	3·0
Interorbital width	6·0	5·0	5·0	5·0	5·0	4·5
Length of caudal peduncle	22·0	20·0	19·0	20·0	18·0	17·0
Least height of caudal peduncle	7·5	7·0	7·0	7·0	6·5	7·0
Longest ray of dorsal	14·0	14·0	14·0	13·5	14·0	12·0
Longest ray of anal	13·0	13·0	13·5	12·5	13·0	12·0
Length of pectoral	17·0	16·0	16·5	15·0	15·0	15·0
Length of ventral	14·0	14·0	15·0	14·0	14·0	12·0

A study of the specimens in the above collection shows that the Helmund species is allied to *Nemachilus stoliczkae*; *N. farwelli*; *N. griffithii* var. *afghana* and *N. stenurus*, but differ from them in many important characters.

The following table shows the important differences between these related species :—

Character.	*N. stolizkae*[1]	*N. farwelli*[2]	*N. griffithii* var. *afghana*[3]	*N. stenurus*[4]	*N. akhtari*
Commencement of dorsal fin.	Conspicuously towards base of caudal.	Nearer tip of snout than base of caudal.	Almost equidistant between tip of snout and base of caudal. (may be slightly nearer caudal).	Nearer to the tip of snout by a distance equal to the length of snout.	Equidistant between tip of snout and base of caudal.
Labial fold.	Thick continuous and papillated post-labial groove interrupted in the middle by a slight ridge.	Well developed fleshy and continuous; lower lip narrowly interrupted in the middle.	Fleshy and continuous at the angles; lower lip is interrupted in the middle.	The lips membraneous feebly wrinkled without any post-labial groove.	Thick continuous and greatly striated; post-labial groove very narrow and on either side of the groove the ridges are prominently enlarged and elongated and extends backwards.
Caudal fin.	Slightly emarginate, lower lobe being longer than the upper.	Slightly emarginate.	Obliquely truncate, the upper lobe slightly longer than lower.	Posterior margin deeply notched, both the lobes are equally long or the upper exceeds slightly the lower.	Slightly emarginate, lower lobe being better developed and longer than upper.
Caudal peduncle-Proportion of least height to length.	3·1—3·6 times.	4 times.	2·0—2·2 times.	7·85—9·2 times.	2·4—2·9 times.
Well marked groove between anus and anal fin.	Absent.	Characteristic.	Absent.	X	Absent.
Proportion of length of head to standard length of body.	4·2—4·8 times.	5·1 times.	4·1—4·2 times.	4·9—5·5 times.	4·4—5·0 times.
Length of alimentary canal to length of fish.	Slightly greater than the length of fish.	X	X	X	Almost 1½ times longer than the length of fish. (Al. canal=165 mm. Total length=117·5 mm.
Distribution.	Helmund river.	Helmund river.	Helmund river.	Helmund river.	Helmund river.

[1]Hora, S. L., *Mem. Conn. Acad.* X, *Art.* xvii, pp. 306—308 (1936).
[2]Hora, S. L., *J. Bombay Nat. Hist. Soc.* XXXVII, No. 4, p. 799 (1935).
[3]Hora, S. L., *ibid.*, XXXVI, No. 3, p. 697 (1933).
[4]Herzenstein, S., *Wiss. Res. Prezewalski Central As. Reis. Zool.* III (2), p. 64, Tab. I, fig. I. (1888).

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