

Report on the collections of Reptiles, Batrachians and Fishes made by Messrs. Potanin and Berezowski in the Chinese provinces Kansu and Sze-chuen.

By

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(Présenté le 24 avril 1896.)

Having, on previous occasions, paid attention to the Reptilian and Fish-Fauna of the Chinese Hinterland, I have had great pleasure in undertaking at the suggestion of Mr. Th. PLESKE the task of examining collections which were formed by the two Russians explorers, Messrs. G. POTANIN and M. BEREZOWSKI, in the provinces Kansu and Sze-chuen, and deposited in the Zoological Museum of the IMPERIAL Academy.

I am indebted to Mr. PLESKE and Mr. BÜCHNER for particulars as to the journeys of those two travellers. I append here a short sketch of them, with the view, first, of fixing the exact localities where the specimens have been collected, and secondly, of assisting those who desire to find them on the map: not an easy matter, as many of the places are not indicated in the best of the generally accessible maps, and as the different modes of spelling the names are most perplexing to any one who is not a Chinese scholar.

The routes of the journeys are given in detail in P. SEMENOW, History of the IMPERIAL Russian Geographical Society, 1845—95. Vol. III, 1896, pp. 1136—1151¹).

POTANIN'S expedition started from Kiachta in the middle of October 1893, and reached Peking on November 13, where it remained for a month. It proceeded to the towns Cheng-ting-fu, Shun-te-fu, crossing the Yellow River to Meng-hsien and to Si-an-fu which was reached on Febr. 2, 1894. On March 9 POTANIN arrived at Cheng-tu-fu, a town within the province of Sze-chuen, and on April 16 Ta-tsien-lu (also called Tarsando). Here he detached a part of the expedition which proceeded to the highlands of Tibet, to Batang, whilst he himself, owing to the illness of his wife, was compelled to commence his return-journey to Peking. However, he selected a route not previously taken by an European. Leaving Ta-tsien-lu on July 2, he reached Rumi-chang-ku, a town on the river Tung, on the 22 of the same month. Thence he marched in the direction of the river Siao-ching-ho, which he followed for fifteen days; and after having crossed a mountain range called Hieng-chao, arrived at the town Li-fang-fu, where he rejoined the rest of his caravan. Before he reached Chu-tsing-fu, Mrs. POTANIN died, whereupon he returned to Russia *via* Peking.

Mr. BEREZOWSKI arrived in China a year before POTANIN. He left Peking on Febr. 14, 1892, and passing through Si-an-fu, Fung-hsien-fu, and Liang-tang settled in Hui-hsien, a town situated in the southern part of Kansu, from March 17 to Decbr. 10. In the latter month he removed to the northern part of the province Sze-chuen, reaching Lun-ngan-fu on Jan. 1, 1893. In March of the same year he met POTANIN at the principal town of the province, Cheng-tu-fu, but returned to Lun-ngan-fu in the following month, selecting a small hamlet Mu-kua-chi, situated about 35 versts from Lun-ngan-fu, for a lengthened residence, viz., from April 15, 1893 to Jan. 26, 1894. Thence he removed to Sung-pan where he lived from Febr. 23 to Oct. 15, 1894.

Very few collections of Reptiles and Fishes have been brought to Europe from the two provinces explored by the

1) П. П. СЕМЕНОВЪ, Исторія полувѣковой дѣятельности Импер. Русск. Геогр. Общества 1845—95, III, 1896, стр. 1136—1151.

Russian travellers. The first were those sent by the Abbé DAVID to Paris, from which M. SAUVAGE described some species in Rev. Zool., II, 1874; Bull. Soc. Phil., I, 1877, May; 1878, Jan.; but a still more important collection was that made by Mr. A. E. Pratt who travelled in the years 1887—90, partly over the same ground as the Russians, but entering Sze-chuen from the Southwest. These collections were described by myself in Ann. & Mag. Nat. Hist., 1888, I; 1889, IV; and in PRATT'S work „To the snows of Tibet through China“, Lond., 1892, 8°.

In order to supplement the following Report, I give here a list of the species discovered by the travellers mentioned, and not contained in the Russian Collection:

a) from the DAVID collection:

Polypedates davidi SAUV.
Pachytriton brevipes SAUV.
Megalobatrachus maximus SIEB.
Tylognathus davidi SAUV.

b) from the PRATT collection:

Lygosoma reevesi GRAY.
Lycodon rufozonatus CANT.
Macrones macropterus BLKR.
Macrones crassilabris GTHR.
Glyptosternum conirostrum STEIND.
Pseudogobio maculatus GTHR.
Rhinogobio cylindricus GTHR.
Barbus sarana H. B.
Rhodeus sinensis GTHR.
Homaloptera fimbriata GTHR.
Homaloptera abbreviata GTHR.
Nemachilus stoliczkae DAY.
Botia pratti GTHR.
Botia superciliaris GTHR.

Taking all these collections together, we find the fauna to be composed (as far as our present knowledge goes) of

1 *Trionyx*
6 Lizards
8 Snakes
9 Batrachians
32 Fishes, viz.:

- 1 *Ophiocephalus*
- 7 Siluroids
- 14 Cyprinoids
- 2 *Homaloptera*
- 7 Loaches (*Cobitidae*)
- 1 *Monopterus*.

There is evidently a large field for future discoveries. From the fact that out of the 56 species enumerated, 22 have been described from specimens collected in Kansu and Sze-chuen, it is evident that the fauna of these provinces has a peculiar type of its own. This is less apparent as far as the Reptiles are concerned, the majority of which are identical with those of Southern China, belonging to what many authors call the Indo-Chinese fauna. Remarkable is the occurrence at so northern a latitude of a species of *Calamaria* (*C. berezowskii*) which, besides, is closely allied to a Javan form.

Among the Batrachians northern types predominate; and the higher altitudes seem to be particularly favourable to the development of Tailed Batrachians. Yet some forms have penetrated from the south-west, as *Rana gracilis*, and a species of *Polypedates*.

The fishes are a mixture of the fauna of the lower portion of the Yangtsekiang and of that of the Central Asiatic Plateau. The smaller mountain-streams seem to abound in Loaches and Loach-like Siluroids, and in the lower and more quiet parts of the rivers, are replaced or accompanied by Gudgeons, of which China possesses an infinite variety. The occurrence of a truly Indian Fish, *Monopterus javanensis*, which has followed the Yangtsekiang throughout its entire course, is a remarkable instance of the wide distribution of a tropical Freshwater-fish.

Reptiles.

Trionyx sinensis WIEGM.

A halfgrown specimen from the town of Chung-chung-chou (POTANIN, June, 1894).

Tachydromus septentrionalis GTHR.

One specimen from the town of Hui-hsien (BEREZOWSKI, 1892).

Japalura yunnanensis ANDERS.

Specimens were obtained by POTANIN on the river Tung (April, 1894) and by BERZOWSKI near the town of Lun-ngan-fu (21 Novbr., 1892). PRATT²) had found it previously at Ichang.

Eumeces xanthi GTHR.

Ann. & Mag. N. H., 1889, Septbr., p. 220.

Discovered by PRATT at Ichang. Specimens obtained by POTANIN near the town of Li-fang-fu (Aug., 1894) and in the valley of the river Tung (April, 1894).

Lygosoma indicum GRAY.

This species originally known from the Eastern Himalayas, and the higher parts of Assam and Burma, was met with in abundance by BERZOWSKI in May & June of 1892 at Sung-pan, and in the autumn of 1893 at Lun-ngan-fu.

2) GÜNTHER, Ann. & Mag. N. H., 1889, Septbr., p. 218.

Lygosoma potanini, sp. n.

Body slender and elongate; the distance between the end of the snout and the forelimb less than one half of the distance between the axil and groin. Limbs feeble; adpressed to the body, they do not meet, and the anterior reaches forward only to the eye. Snout short, obtuse. Lower eye-lid with a transparent disk. Nostril pierced in the nasal; no supranasal. Anterior frontal broader than long, broadly in contact with the rostral, and less broadly with the vertical. Vertical in contact with the first and second supraoculars; four supraoculars, second largest; seven supraciliaries. Occipital divided into the usual five scutes, the central as large as one of the anterior; posterior occipitals meeting by a short sutura. Three pairs of nuchals; the fifth upper labial below the eye. Ear-opening smaller than the orbit, without lobules. Twenty-seven rows of smooth scales round the middle of the body; fifty-eight scales in a longitudinal series between the axils. A pair of large praeanales.

The fourth toe with seventeen lamellae on its lower side.

Brownish-olive on the back with a median black line. Along the side a blackish band, commencing behind the eye, and separated from the back by a whitish edge. Abdomen whitish; lower part of the tail speckled with black.

Length of head and body	55	millim.
" " tail (slightly reproduced)	80	"
Distance of snout from ear	9	"
" " " " forelimb	16	"
" between axils	38	"
Length of fore-limb.	12	"
" " hind-limb.	17	"

This species differs from *L. laterale* by a smaller ear-opening, and from *L. himalayanum* by a considerably more slender body, much weaker limbs and by lacking every trace of lobules or tubercles on the front-margin of the ear.

A single specimen from the town of Ta-t sien-lu (POTANIN).

Calamaria berezowskii, sp. n.

(Pl. I, fig. A.)

Rostral shield reverted to, and distinctly visible on, the upper side of the head. Vertical as broad as long, about four times as wide as the supraocular; one ante-, and one post-ocular. Four upper labials; the first pair of lower labials meeting behind the symphysial. Two pairs of chin-shields, without a central shield between them, the anterior not much longer than the posterior. Orbit narrower than its distance from the labial margin. Ventrals 155, 167; subcaudals 22, 14. Tail rather obtuse, with a conical end. Upper parts brown, with a faint dark line along each side of the back, and another running along the meeting edges of the two outer series of scales. Lower parts, and the lower half of the outer-most row of scales uniform white. A more or less distinct yellowish collar, about five scales distant from the head. Two pairs of small white spots may be present or absent on the tail.

Total length	290 mill.	245 mill.
Length of head	8 "	7 "
" " tail	18 "	25 "

Two specimens from Lun-ngan-fu (BEREZOWSKI, 1893).

This species is allied to its compatriot, *Calamaria septentrionalis*, but has an entirely different rostral shield. In this respect it comes nearer to *Calamaria siamensis*, which has a narrower vertical shield, and variegated abdomen.

Coluber phyllophis BLGR.

Head of an adult specimen from Lun-ngan-fu (BEREZOWSKI).

Zaocys dhumnades CANT.

One halfgrown specimen from Lun-ngan-fu (BEREZOWSKI).

Tropidonotus tigrinus BOIE.

Two specimens from the town of Hui-hsien (BEREZOWSKI).

Tropidonotus macrophthalmus G_{THR.}

A young specimen from the town of Ta-t sien-lu (POTANIN, 12 May, 1894).

Halys blomhoffi (BOIE).

One specimen from the town Hui-hsien (BEREZOWSKI, 1892).

After comparison of specimens from different parts of Central Asia I begin to doubt very much the specific distinctness of this form from *Halys halys* (PALL.) and *H. intermedius* (STRAUCH, Die Schlangen d. Russ. Reichs, p. 245).

Trimeresurus monticola G_{THR.}

One specimen from the town of Lun-ngan-fu (BEREZOWSKI, Summer 1893).

Batrachians.

Rana temporaria L.

Town of Sung-pan (BEREZOWSKI, May & June, 1894).

Rana gracilis WIEGM.

A single specimen of this southern form, from the town of Ya-chou, March 27, 1894 (POTANIN).

Nanorana, g. n.

Ranidarum.

Tongue emarginate behind; vomerine teeth none. Toes not dilated at the tips, webbed; fingers free; outer metatarsals separated by a groove. Pupil horizontal. Omosternum and sternum with a bony style.

Nanorana pleskei, sp. n.

In form similar to a *Rana esculenta*; snout depressed, with the sides and front sloping, the canthus rostralis being rather obtuse. Snout rather longer than the eye; nostril in the middle of its length. Interorbital space as wide as the eyelid. Tympanum covered by the general integument, not quite half as large as the eye. Skin of the upper and lower parts smooth. The two inner fingers subequal in length. If the hind-limb be carried forwards, the tarso-metatarsal joint does not reach the end of the snout. Only one very indistinct metatarsal tubercle. Toes halfwebbed, but the web, extending along the toes, forms a narrow fringe along the sides of each toe. Inner finger of the male thickened.

Tongue emarginate behind; a very low, linear, oblique bony ridge inside each choana, but without any dental structure. Choanae and particularly Eustachian openings small. Male without vocal sac.

Upper parts olive, with elliptic brown, black-edged spots. Lower parts white.

Length of the body of adult female	40 millim.
" " third finger	9 "
" " hind-limb	55 "
" " fourth toe with metatarsal	19 "

This frog is a dwarf-form of *Rana*; fortunately an adult female (with matured ova) and an adult male are in the collection. Two females were collected by BEREZOWSKI at Sung-pan (June, 1894), and one male by POTANIN at In-chuan in the Kham mountains (March 1894).

Bufo vulgaris L.

Two specimens which undoubtedly are the common European Toad, were collected by BEREZOWSKI, one in the town of Hui-hsien (1892), and the other at Lun-ngan-fu (10 May, 1893). But I have long hesitated, and still feel some uncertainty, with regard to three other specimens obtained by POTANIN in the

mountains of Kham (May & June, 1894). They are covered above and below with deep-black spots, have somewhat broader webs between the toes, and possibly a metatarsal fold. They possess no fontanelle on the upper part of the skull. Unfortunately the specimens are in a poor state of preservation, so that, if they were another species the distinctive characters could not be pointed out. Two other examples found in the same locality by the same traveller, are much paler in coloration, and have the lower parts uniform whitish.

Bufo mammatus, sp. n.

Crown without bony ridges. Head broad, snout obtuse, with the bones of the jaw remarkably feeble. Interorbital space as broad as the eye-lid. Tympanum small, entirely hidden under the skin. Fingers rather slender, the first and second subequal in length; legs thin; the hind-limb being carried forwards, the tibio-tarsal articulation reaches the eye; metatarsus with an elliptical, flat tubercle; subarticular tubercles very indistinct. The three outer toes not half-webbed, but the web between the three inner ones is as broad, as that between the three outer ones. Upper surfaces with very flat, glandular patches, that representing the parotoids not more prominent than the others. Lower parts smooth, but there is an oval white or pink gland on each side of the chest, immediately behind the shoulder-joint. Legs smooth, with small simple glands disseminated over the hinder part of the thighs. Uniform black, or dark-brown with the glandular patches on the back of a darker shade.

Length of the body	60 millim.
" " third finger	12 "
" " hind-limb	84 "
" " fourth toe with metatarsal	27 "

Three specimens were obtained by Mr. POTANIN in the mountains and on the plateau of Kham (Tung-so-lo) on May 16 and July 3, 1894. Although they are in an indifferent state of preservation, they possess such striking characters that I could not hesitate to describe the species.

Batrachyperus sinensis SAUVAGE.

This seems to be an extremely common species, of which a considerable number of specimens were collected both by BEREZOWSKI at Sung-pan (June, 1894), and by POTANIN at Kuo-chu-chin in the mountains of Kham (June, 1894). The latter traveller says that the Chinese call this newt „Chang-huo-yu“, and the nomen tangutanum: „Zii-nia“.

In very young specimens the palatine teeth are placed somewhat differently from the mature condition; they form two oblique series extending beyond the level of the choanae. Abnormal conditions of the toes are not scarce, in one specimen (n. 195) one of the metatarsal tubercles is so much enlarged as to simulate a fifth toe.

Fishes.

Ophiocephalus argus CANT.

Four specimens from Cheng-tu-fu (POTANIN, March, 1894). Chinese name „Uwyyu-yu“. Apparently distributed along the entire course of the Yangtsekiang.

Silurus asotus L.

Specimens of this species which is generally distributed over the Chinese Empire, were collected by BEREZOWSKI at Huihsien, where it is called „Liang-pa-liang“, and by POTANIN at Cheng-tu-fu and in the river Ya.

Macrones pratti GTHR.

GÜNTHER in PRATT, SNOWS of Tibet, p. 245; pl. 1, fig. B.

The specimens collected by POTANIN, were taken in the river Ya (April, 1894); they do not differ from the type, but young specimens of 3—4 in. have the adipose fin rather shorter than the anal.

Amblyceps marginatus GTHR.

GÜNTHER in PRATT, SNOWS of Tibet, p. 245; pl. 2, fig. A.

Several specimens from the river Ya (POTANIN, April, 1894).

Exostoma davidi (SAUVAGE).

Chimarrichthys davidi SAUVAGE, Rev. Zool., II, 1874, p. 332.

Found in considerable numbers by BEREZOWSKI near the town of Lun-ngan-fu, and by POTANIN in the river Ya. Its Chinese name is „Shih-pa-tsu“. It spawns in May or June. The largest of the specimens is 210 mill. long, but females of half that size are mature. In size the ova equal those of a Trout.

Cyprinus carpio L.

Three specimens from Cheng-tu-fu (POTANIN, March, 1894).

Cyprinus auratus L.

The wild form of the Gold-fish is common throughout the province, numerous specimens having been brought by BEREZOWSKI from Hui-hsien, and by POTANIN from Cheng-tu-fu and Ya-chou. Chinese name „Chi-yu“.

? **Schizothorax argentatus** KESSL.

Schizothorax argentatus HERZENSTEIN in Wissenssch. Result. d. v. PRZEWALSKI unternom. Reis., Zool., Bd. III, Abth. 2, 1889, p. 137.

Three young *Schizothorax*, 190 and 160 mill. long, were collected by POTANIN in streams of the mountains of Kham in April, 1894; he states that the Chinese call this fish „Chung-tsu-yu“ and the Tanguts „Se-nia“. With the assistance of the late S. HERZENSTEIN's invaluable memoir of the fishes of this genus I refer these specimens to KESSLER's *Sch. argentatus*, and a direct comparison

with two specimens of this latter species, which I obtained from the IMPERIAL Academy for the British Museum, would seem to confirm this identification. However, it must be remembered, that *Sch. argentatus* belongs to the Fauna of the Balchash and Tarim basins, and that, therefore, the Kham fish most probably is a distinct species. Unfortunately the specimens are not sufficiently well preserved, to serve for a reliable description, and I must prefer to apply for them the name of the species, to which they evidently are most closely allied.

Kham seems to be the most extreme eastern limit to which the genus *Schizothorax* extends, neither BEREZOWSKI nor PRATT having found specimens of these Barbets.

Schizothorax sinensis HERZ.

HERZENSTEIN, l. c., p. 175; tab. 20, fig. 2.

Two very young specimens, 105 millim. long, and a quantity of fry were collected by BEREROWSKI at Lun-ngan-fu, the same locality where the typical examples were obtained.

Onychostoma, g. n.

Scales of moderate size. Anal fin short, with six branched rays. Dorsal fin with a strong, serrated osseous ray, and with not more than nine branched rays, opposite to the ventrals. Snout obtusely rounded, with the mouth transverse, on its lower side. Mandible short, flat, covered with a broad, horny sharp sheath, without labial fold. Barbels none. Pharyngeal teeth $4/3/2-2/3/4$, slightly compressed. None of the anal scales enlarged.

Onychostoma laticeps, sp. n.

(Pl. I, fig. B.)

D. 12. A. 8. V. 9. L. lat. 47. L. transv. 8/8.

General form of the body like that of a Roach (*Leuciscus rutilus*), but with the post-dorsal portion rather more elongate. The upper profile ascends behind the head towards the dorsal

spine which is the highest point of the body. The greatest depth of the body is one third of its length (without caudal).

The head is short and thick, its length being one fifth of the total (without caudal). It is as thick as the body, the snout being not attenuated towards its end, which gives a very peculiar appearance to the fish. The upper side of the head is convex transversely, and parabolic longitudinally, the width of the interorbital space being three-fifths of the length of the head. The eye is nearer to the end of the snout, than to that of the operculum, and two ninths of the length of the head. Mouth very broad, the horny edge of the lower jaw forming a very open angle in the middle. The end of the maxillary is in the vertical from the front margin of the orbit. A free labial fold runs round the circumference of the upper jaw, the lower having no trace of a lip.

Origin of the dorsal fin considerably nearer to the end of the snout, than to the root of the caudal; its osseous ray about as long as the head. Anal fin higher than long, not reaching the caudal, when laid backwards, inserted below the posterior half of the dorsal. Caudal fin deeply forked, with the lobes pointed. Pectoral nearly reaching to the vertical from the origin of the dorsal, not reaching the ventral which is very little shorter, but does not reach the vent.

There are four and a half longitudinal series of scales between the lateral line and the ventral fin.

Greenish on the back, silvery on the sides.

Total length	248 millim.
Total length without caudal	198 "
Height of body below dorsal spine	65 "
Length of head	40 "
Width of interorbital space	21 "
Diameter of the eye	9 "
Width of mouth	21 "

One specimen from a river near Hui-hsien (BEREZOWSKI, 1892).

Leucogobio, g. n.

Scales of moderate size; lateral line running along the middle of the tail. Dorsal fin short, without spine, opposite to the ventrals. Anal fin short, with not more than six branched.

rays. Mouth anterior and lateral, with a minute barbel at the corner; both jaws with simple, narrow lips, the lower lip not extending across the symphysis. Gill-rakers very short; pseudo-branchiae. Pharyngeal teeth $5/3$ or 2 or $1-1$ or 2 or $3/5$, slightly hooked.

This genus belongs to the same group as *Gobio*, *Pseudogobio* etc., but is distinguished by the formation of its mouth which is that of a *Leuciscus*. I refer to it two species, of which the first does not form part of the Russian, but is best described here in connection with its congener.

Leucogobio herzensteini, sp. n.

(Pl. II, fig. B.)

D. 10. A. 8. V. 8. L. lat. 39. L. transv. $4\frac{1}{2}/5$.

The height of the body is one fourth of the total length, without caudal, the length of the head two ninths. Head broad, relatively to its length, with the snout a little longer than the eye which is two-ninths of the length of the head, and three-fifths of the width of the interorbital space. Mouth anterior, much wider than deep, its corner being below the middle of the length of the snout; barbels minute. The origin of the dorsal fin is distinctly in advance of the root of the ventral, and nearer to the end of the snout, than to the root of the caudal.

Pectoral fin longer than the head, without snout, terminating a long way from the ventral. Ventral fin shorter than the pectoral and reaching the vent. There are three series of scales between the lateral line and the ventral fin. Silvery, back brownish; a bluish band along the side of the body, widening on the tail where it is three and a half scales broad; many of the scales on the side and back are blackish. The dorsal rays in the upper half with an elongate black spot each.

Total length without caudal . . .	70	millim.
Length of the head	16	"
" " " eye	3.5	"
" " " pectoral fin	13	"

Two specimens, of which the larger is an adult female, were collected by BEREZOWSKI at Hui-hsien in May, 1892. Chinese

name „Ma-yu“. Both have lost their caudal fin which probably is emarginate as in *L. taeniatus*. From the latter species the present is distinguished by a much shorter and broader snout and mouth. Pharyngeal teeth 5/1—1/5. Intestinal tract with one convolution only. Peritoneum with black pigment-spots.

***Leucogobio taeniatus*, sp. n.**

(Pl. II, fig. A.)

D. 10. A. 8. V. 8. L. lat. 40. L. transv. 6/6.

The height of the body equals the length of the head which is one fourth of the total length (without caudal). Head oblong, with the snout longer than the eye which is two ninths of the length of the head and two thirds of the width of the inter-orbital space. Mouth slightly oblique, as wide as long, not extending to below the orbit; barbel scarcely as long as the pupil, on the extremity of the intermaxillary. The origin of the dorsal fin is opposite to that of the ventral, and midway in the length of the body. Pectoral as long as the head without snout, terminating a long way from the ventral. Ventral fin nearly as long as the pectoral, and nearly reaching the vent. Caudal fin deeply emarginate. There are three series of scales between the lateral line and the ventral fin. Silvery, back brownish, a blackish band from the upper part of the gill-opening along the middle of the tail, to the root of the caudal fin; it gradually becomes more distinct and widens behind, being three scales broad on the tail. Fins colourless.

Total length	105 millim.
Length of the head	22 "
Total length without caudal . .	85 "
Length of eye	4 ₈ "
" " pectoral fin	15 "

An adult female was collected in the head waters of the Yangtsekiang (POTANIN). The intestine makes one convolution only; the peritoneum is pigmented with brown. Pharyngeal teeth 5/2—3/5.

Acanthogobio HERZ.

Acanthogobio HERZENSTEIN: Mém. biol., XIII, 1892, p. 228.

Scales of moderate size; lateral line present. Dorsal fin short, with a smooth osseous spine, and with its anterior portion in advance of the ventrals; anal fin short. Mouth inferior, longer than wide, both jaws with thick lips; a barbel at the angle of the mouth. Gill-rakers short; pseudobranchiae well developed. Pharyngeal teeth $5/2$ or $3-2/5$, hooked.

Acanthogobio guentheri HERZ.

Acanthogobio Guentheri HERZENSTEIN, l. c.

D. 10. A. 8. V. 9. L. lat. 45. L. transv. 7/7.

The body is slightly compressed, but low and elongate, its greatest depth (in front of the dorsal fin) being one fourth of the total length (without caudal). The head is much longer than deep, particularly in its anterior portion; its upper surface is flat, with gradually descending profile. Interorbital space wider than the orbit. The large eye is immediately below the upper profile, and occupies nearly the middle of the length of the head, of which it is two ninths. Snout pointed, the upper jaw overlapping the lower and the horse-shoe-shaped mouth. This is inferior, reaching backwards to the vertical from the nostril, and surrounded by thick lips. The upper lip is continuous round the jaw, the lower slightly interrupted at the symphysis, where in old examples a rudimentary central lobe becomes visible. The barbel at the angle of the mouth is not quite so long as the eye.

Praeorbital long, suborbitals narrow and feeble; operculum high and short.

The dorsal spine is very strong, rather nearer to the snout than to the root of the caudal; the fin is lower than the body underneath. The anal fin does not reach the caudal when laid backwards. Caudal deeply forked. Pectoral not reaching the ventral. Ventral fin inserted below the posterior half of the dorsal, terminating at a considerable distance from the vent.

Abdomen and breast scaly. There are four longitudinal series of scales between the lateral line and ventral fin.

Uniform silvery, greenish on the back.

Total length	245	millim.
" " (without caudal) .	200	"
Length of the head	55	"
" " snout	23	"
" " pectoral fin	40	"
" " dorsal spine . . .	35	"
Greatest depth of the body . . .	50	"

Three specimens were collected by BEREZOWSKI in a large river near the town of Hui-hsien (June, 1892). The typical specimens came from Huang-ho (PRZEWALSKI), and from the river Sinin (POTANIN).

Opsariichthys bidens G^THER.

GÜNTHER, Ann. & Mag. N. H., 1873, Septbr., p. 249.

Numerous examples of both sexes and various sizes were collected by BEREZOWSKI in rivers near the town Hui-hsien (June & July, 1892). The Chinese name of this fish is „Tou-hua-pan-tzu“. The size of the largest male is 180 mill., and of the largest female 160 mill.

Very extraordinary secondary sexual characters are developed in this fish, some of a permanent, others of a merely seasonal kind.

The former consist in the form of the head which in the adult male is shorter and deeper than in the female, its depth at the occiput being more than its length without snout, whilst in the female it is less. The dorsal fin is larger and stronger in every direction than in the female. Finally the male has the fourth and fifth, or fourth and sixth anal rays much enlarged and prolonged, so as to extend beyond the root of the caudal fin. In males which approach maturity the dorsal fin shows ornamental colours in the form of black stripes on the interradial membrane. Also dark vertical cross-bands appear on the body which seem to be absent in the female.

During the spawning-season the male develops brown horny tubercles on the snout and head; they are arranged in several rows on the mandible, and in a single row along the praeopercular margin, below the eye, along the lower margin of the sub-orbital ring and on the intermaxillary. After the breeding-season the tubercles drop off, leaving a circular scar which after some time disappears entirely.

Misgurnus anguillicaudatus CANT.

The most common species of Loach in the Chinese Empire. Numerous examples were collected by BEREZOWSKI at Hui-hsien; he gives two Chinese names for this fish, viz. „Ni-ohu“ and „Tsu-lien-yu“.

? **Nemachilus robustus** KESSL.

Four specimens brought by POTANIN from the mountains of Kham are not in a good state of preservation, but seem to be closely allied to, if not identical with KESSLER's *N. robustus*, the original specimens of which were collected by PRZEWALSKI in Kansu (see HERZENSTEIN in *Wissensch. Result. d. v. PRZEWALSKI unternomm. Reis., Zool., Bd. III, Abth. 2, 1888, p. 38; tab. 5, fig. 1.*)

Nemachilus berezowskii, sp. n.

(Pl. II, fig. C.)

The intermaxillaries form a symphyseal cutting incisor-like projection; the mandibles are dilated, spoon-shaped, with a sharp edge, both, the upper and lower jaws being covered with a thin skin.

D. 11. A. 6. P. 11. V. 8.

The skin of the tail and of the hinder part of the sides is covered with rudimentary scales. Body very slender, its greatest depth being one eighth of the total length (without caudal); the tail is not lower than the body, strongly compressed, its depth being increased by an adipose layer on its upper and lower sides. The length of the caudal peduncle is a little more than one seventh of the total. Head small, and depressed, one sixth of the

total length (without caudal); eye very little nearer to the end of the snout than to the end of the gill-cover. Each mandible with a simple labial fold, the folds being separated at the symphysis, but no longitudinal groove between them. Barbels rather short, that at the angle of the mouth being about twice as long as the eye. Nostrils close together.

Dorsal fin longer than high; its origin is very slightly in advance of the root of the ventral, and the whole fin is somewhat nearer to the end of the snout than to the root of the caudal. Caudal fin rounded. Pectoral rounded, the fifth ray being the longest; it is shorter than the head, and its length only two fifths of the distance of its root from the ventral. The ventral fin terminates a long way from the vent. The air-bladder does not send a prolongation into the abdominal cavity. Light brownish yellow with brown crossbands, irregular on the trunk, regular on the tail, and much wider than the interspaces; there are nine of these bands on the caudal portion of the body. Dorsal rays with two series of deep-brown streaks; the other fins immaculate.

Total length	137	millim.
" " without caudal . . .	122	"
Length of the head	20	"
" " caudal peduncle . . .	18	"

One specimen was obtained by BEREZOWSKI at Hui-hsien (May, 1892). Chinese name „Sa-pang“.

Nemachilus potanini, sp. n.

The symphyseal end of each maxillary is dilated, and forms an incisor-like projection; each mandible is dilated into a broad sharp-edged lamella, separated from its fellow by a deep notch. These pseudodont projections are covered by a thin, soft skin.

D. 11. A. 6. P. 10. V. 8.

Minute rudiments of scales are imbedded in the skin of the tail and posterior part of the sides. Body moderately slender, its greatest depth being nearly one sixth of the total length (without caudal); the tail is not lower than the body, strongly compressed, its depth being increased by an adipose layer on its

upper and lower edges. Caudal peduncle not twice as long as deep, one seventh of the total length, without caudal. Head elongate, rather depressed, one fourth of the total length; eye nearer to the end of the snout, than to the end of the gill-cover. Each mandible with a simple labial fold, the folds being separated at the symphysis. Barbels moderately short, that at the angle of the mouth being twice as long as the eye. Nostrils close together.

Dorsal fin rather longer than high; its origin is somewhat in advance of the root of the ventral, and a little nearer to the root of the caudal, than to the end of the snout. Caudal fin rounded. Pectoral oblong-ovoid, the fourth ray being the longest; it is shorter than the head, half as long as the distance of its root from that of the ventral. The ventral fin does not reach the vent. Brownish, with dark marbling, which assumes the shape of cross-bands on the tail. They are wider than the interspaces; there are five of these bands on the caudal portion of the body; the last, on the root of the tail, is deep-black. Dorsal rays irregularly spotted with black.

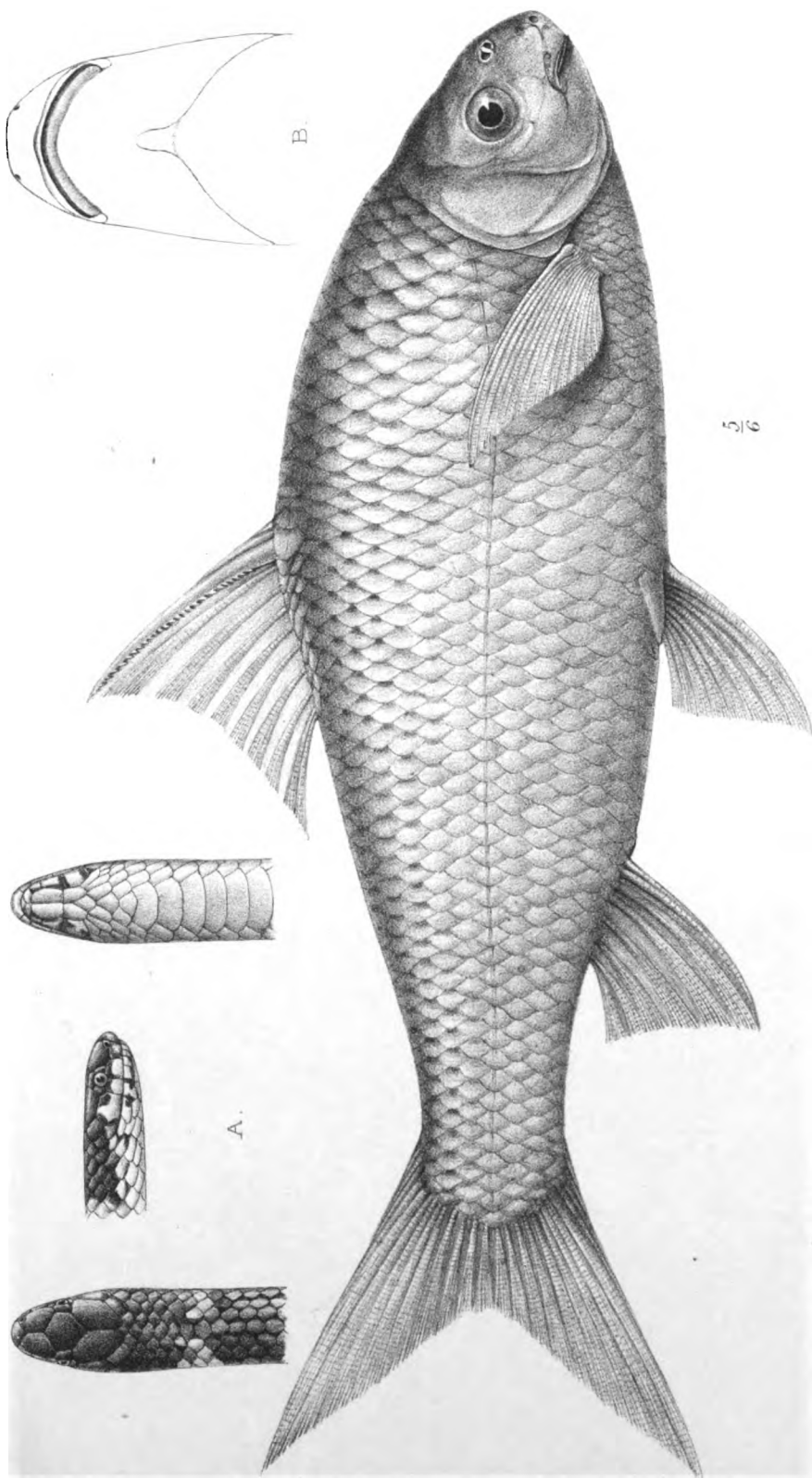
Total length	111	millim.
" " without caudal . . .	95	"
Length of the head	23	"
" " " eye	4	"
" " caudal peduncle . . .	14	"

Three specimens from the river Ya (POTANIN, 1894).

Monopterus javanensis LACÉP.

An Indian species distributed throughout the system of the Yangtsekiang. It is still common at Hui-hsien where BEREZOWSKI collected numerous examples. Chinese name „Huang-shan“.





J. Green del. et lith.

Mintern Bros. imp.

A. Calamaria berezovskii. *B. Onychostoma laticeps.*



C.



A.



B.

J Green del et lith.

A. Leucogobio tenuitatus. B. Leucogobio herzelevitzi. C. Nemachilus herzelevitzi.

Mintern. Bros. imp.