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Notes on the Fresh Water Fishes from the Upper Reaches of the River Sungari, with Some Zoogeographical Consideration

By

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As a member of the biological survey of Mt. Hakuto and the surrounding district, led by the local government of Fu-Sung of Manchoukuo in 1940, the author had a chance to collect the fishes of the upper reaches of the Sungari which rises from the south-western slope of Mt. Hakuto. The upper basin of the river is covered with thick forest and so the river water is always rich, clear and cool. The fishes living in these reaches are all pure fresh water fishes which is common to the upper streams of the northern river. •

The studies on the fishes of the river have been very scanty and we have only works made by L. S. BERG (1909, '12, '16, '31, '33, '34) and T. MORI (1927, '36). However, the species identified in these works were all collected in the down-streams of Kirin, or in other reaches of the Sungari. C. SOWERBY (1930) briefly described in his work, "The Naturalist in Manchuria" many species of fresh water fishes including three species, *Brachymystax lenok* (PALLAS), *Thymallus (Thymalloides) grubei* DYBOWSKI, *Phoxinus lagowskii lagowskii* DYBOWSKI, collected in the streams of Hui-Fa-Ho of western Kirin. This is an only report which touches to the fishes from the reaches of upper Kirin.

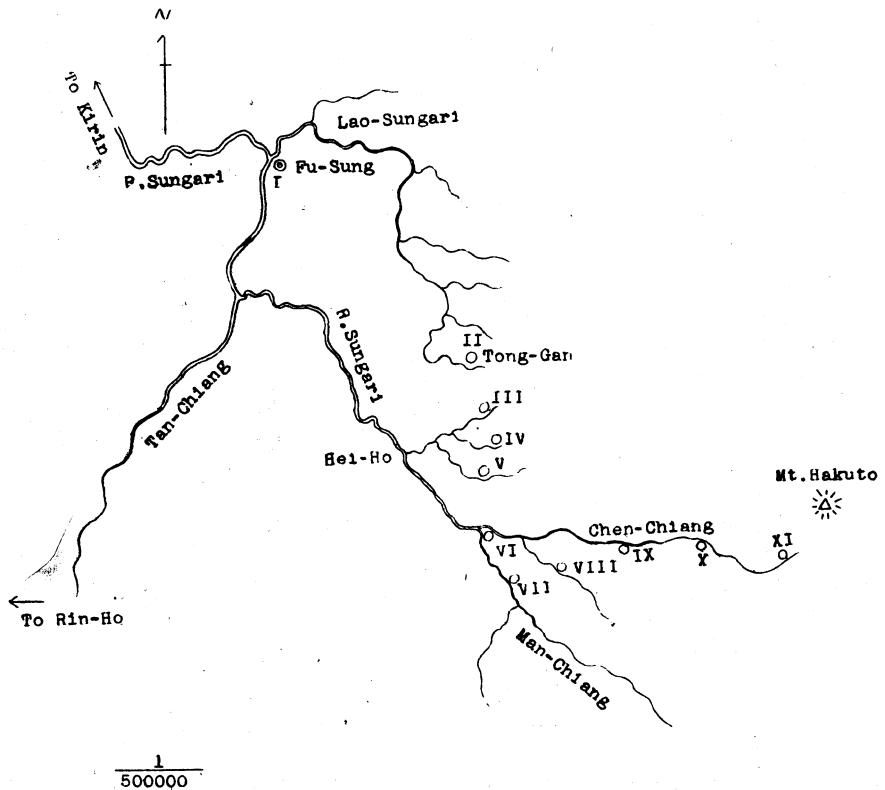
The present survey was carried out from July 21st to August 2nd in 1940. At this time however unfortunately it was very inconvenient for the researches of fishes, as the party was led chiefly for other purpose. The following 19 species were collected within a very limited time by the party encamping near the river. Were there more time, the reaches of the river would have been more thoroughly investigated, and could have supplied more materials for the study.

On the return trip, the author had a chance to collect some fishes near Rin-Ho (middle reaches of R. Yalu), and proved those species absolutely different from those of the Sungari. Formerly A. GÜNTHER, L. S. BERG, T. KAWAMURA and T. MORI divided Manchuria zoogeographically according to the distribution of fishes, into two districts, namely the Siberian and China Subregions. According to their study, the upper reaches of the Sungari obviously belongs

to the Siberian Subregion and the district of Rin-Ho belongs to the China Subregion. Therefore, zoogeographical demarcation line of Manchuria runs through between these two districts (Fu-Sung and Rin-Ho). This assertion is also reached by the author comparing the fish fauna studied in this survey.

Here the author wishes to thank Mr. YAMASAKI, Professor of Zoology, Preparatory Department of Mukden Medical University, for his kindness in furnishing him with valuable limnological data, and also to the Research Department of South Manchurian Railway Company which arranged him to take part in this survey.

Sketch Map of the upper reaches of River Sungari



Limnological data at different station of the river.

Locality (Station No.)	Date (1940)	Altitude (m.)	Air Temp. (°C)	Water Temp. (°C)	pH	Notes
Fu-Sung (I) Sungari	VII, 21, 14.30	429	25.0	21.3	7.6	A little muddy, Breadth 150 m.
Lao-Sungari	VII, 21, 12.00	429	24.5	20.0	7.4	A little muddy, B. 80-100 m.
Tong-Gang (II)	VII, 24, 16.00	980	28.0	25.0	6.6	Muddy brook
Upper reaches of Hei-Ho (III)	VII, 25, 11.00	1030	28.0	15.0	—	Clear brook
(IV)	VII, 25, 14.00	1130	26.0	16.0	6.0	Muddy brook
(V)	VII, 25, 16.30	1180	23.0	17.2	6.9	A little muddy, B. 3-4 m.
Conflux point of Man-Chiang and Chen-Chiang (VI) Man-Chiang	VII, 25, 20.00	1060	20.0	15.0	7.1	Clear current, B. 40-50 m.
Man-Chiang	VIII, 1, 16.00	1060	—	22.2	7.4	—
Chen-Chiang	VIII, 1, 16.00	1060	—	18.6	7.2	Clear current, B. 30-40 m.
Man-Chiang Village (VII)	VII, 26, 5.30	1100	15.0	13.0	6.8	Clear current
Upper reaches of Chen-Chiang (VIII)	VII, 26, 12.00	1180	25.0	14.4	7.1	Clear current
Wei-Sha-Ho (IX)	VII, 26, 16.30	1215	19.0	11.9	7.0	Clear current
Liu-Chia-Tang- Tzu (X)	VII, 28, 5.00	1650	14.0	4.8	6.6	Clear brook No fish
Ti-Tzu-Ho (XI)	VII, 28, 14.00	1780	—	7.2	6.6	Clear brook No fish

A list of fishes from the upper reaches of the river Sungari.

Family *Salmonidae*

- 1)
- Hucho taimen*
- (PALLAS)

Family *Coregonidae*

- 2)
- Brachymystax lenok*
- (PALLAS)

Family *Thymallidae*

- 3)
- Thymallus arcticus grubei*
- (DYBOWSKI)

Family *Cyprinidae*Subfamily *Cyprininae*

- 4)
- Cyprinus carpio*
- LINNAEUS

- 5)
- Carassius auratus*
- (LINNAEUS)

- 6)
- Phoxinus oxycephalus*
- (BLEEKER)

- 7)
- Phoxinus lagowskii*
- (DYBOWSKI)

- 8)
- Xenocypris macrolepis*
- BLEEKER

- 9)
- Gobio gobio*
- (LINNÉ)

- 10)
- Ladislavia taczanowskii*
- DYBOWSKI

- 11)
- Hemibarbus labeo*
- (PALLAS)

- 12)
- Hemiculter leucisculus*
- (BASILEWSKY)

- 13)
- Rhodeus sericeus*
- (PALLAS)

Subfamily *Cobitinae*14) *Cobitis taenia* LINNAEUS15) *Lefua costata* (KESSLER)16) *Barbatula toni* (DYBOWSKI)Family *Siluridae*17) *Parasilurus asotus* (LINNAEUS)Family *Bagridae*18) *Pelteobagrus ussuriensis* (DYBOWSKI)Family *Cottidae*19) *Cottus poecilopus* HECKEL

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Description

Family *Salmonidae**Hucho* GÜNTHER, 18661. *Hucho taimen* (PALLAS)Japanese name; *Amur-Itô*, Manchurian name; *Jeh-lo-yü*.

Two specimens, total length 750.0 (♀), 303.0 mm. (♀), collected station VI, VIII. Head 3.7–4.1 in body length (without caudal fin); depth 5.3–5.7. Eye 7.2–7.8 in head; snout 3.7–4.0; interorbital space 3.2–3.6; depth of caudal peduncle 3.4. D. III, 10; A. III, 9; L. lat. 208–210; Branchiostegal rays 12; Pyloric caeca 180.

This species is common at station VI, VII, VIII.

Family *Coregonidae**Brachymystax* GÜNTHER, 18662. *Brachymystax lenok* (PALLAS)Japanese name; *Kokuchi-masu*, Manchurian name; *Hsi-lin-yü*.

Three specimens, total length 480.0 (♀), 250.0 (♀), 203.0 mm. (♂), collected station VI, VIII. Head 3.7–4.3 in body length; depth 3.7–3.8. Eye 4.5 in head; snout 3.7–3.8; interorbital space 3.1–3.2; depth of caudal peduncle 2.3–2.6. D. III, 11–12; A. III, 10–11; L. lat. 136–145; Branchiostegal rays 12; Pyloric caeca 105.

This species is common at station VI, VII, VIII.

Family *Thymallidae**Thymallus* LINCK, 18903. *Thymallus arcticus grubei* (DYBOWSKI)Japanese name; *Hana-masu*, Manchurian name; *Pan-tsun-yü*.

Three specimens, total length 225.0 (♂), 194.0 (♂), 137.0 mm. (♀), collected station VI, VIII. Head 4.1–4.7 in body length; depth 3.4–4.1. Eye 3.7–4.1 in head; snout 4.1–4.7; interorbital space 3.0–3.4; depth of caudal peduncle 2.4–2.9. D. VIII–IX, 14; A. III, 10; L. lat. 87–91; Branchiostegal rays 10–11; Pyloric caeca 14.

This species is common at station VI, VII, VIII.

Family *Cyprinidae*Subfamily *Cyprininae**Cyprinus* LINNÉ, 17584. *Cyprinus carpio* LINNAEUS

Japanese name; *Koi*, Manchurian name; *Li-yü*.

A specimen, total length 180.0 mm., collected station I. Head 3.7 in body length; depth 3.3. Eye 5.9 in head; snout 2.5; interorbital space 2.5; depth of caudal peduncle 2.0. D. III, 18; A. III, 6; L. lat. 36 (6/5).

This species is present at station I.

Carassius NILSSON, 18325. *Carassius auratus* (LINNAEUS)

Japanese name; *Funa*, Manchurian name; *Chi-yü*.

A specimen, total length 176.0 mm. (♀), collected station I. Head 3.6 in body length; depth 2.2. Eye 5.8 in head; snout 3.3; interorbital space 2.4; depth of caudal peduncle 1.8. D. III, 18; A. III, 6; L. lat. 30 (6/6).

This species is common at station I.

Phoxinus (RAFINESQUE) AGASSIZ, 18356. *Phoxinus oxycephalus* (BLEEKER)

Japanese name; *Abura-haya*, Manchurian name; *Ou-lin-yü*.

Two specimens, total length 108.0 (♀), 100.0 mm. (♂), collected station III, IV. Head 3.7–4.0 in body length; depth 4.2–4.5. Eye 5.3–5.8 in head; snout 3.3–3.5; interorbital space 2.6; depth of caudal peduncle 2.0. D. III, 7; A. III, 7; L. lat. 74, 76; Number of vertebra 37, 38.

Body elongate, subcylindrical, slightly compressed; dorsal outline rather rounded, ventral outline is also slightly convex. Head comparatively small, somewhat depressed and flattened above, top of it rather concave.

This species is very common at station II, III, IV.

7. *Phoxinus lagowskii* (DYBOWSKI)

Japanese name; *Abura-haya*, Manchurian name; *Ou-lin-yü*.

Three specimens, total length 110.0 (♂), 99.0 (♀), 76.0 mm. (♂), collected station II, III. Head 3.6–3.7 in body length; depth 4.4–4.5. Eye 4.3–4.8 in head; snout 3.4–4.0; interorbital space 2.8–3.1; depth of caudal peduncle 2.6–2.8. D. III, 7. A. III, 7; L. lat. 99–108; number of vertebra 40.

Body elongate, compressed, slender, ventral outline rounded, dorsal outline rather flat; the top of the head slightly concave, snout long and pointed.

This species is very common at station II, III, IV.

Remarks:—The present species is closely allied to *P. oxycephalus*, but differs from it in having more compressed and slenderer body, smaller scale and vertebra, larger eye and slenderer caudal peduncle.

***Xenocypris* GÜNTHER, 1868**

8. *Xenocypris macrolepis* BLEEKER

Japanese name; *Yokoguchi*, Manchurian name; *Huang-gu-tsu*.

Three specimens, total length 230.0 (♂), 210.0 (♂), 175.0 mm. (♀), collected station I. Head 4.2–4.6 in body length; depth 3.6–3.8. Eye 4.2–4.3 in head; snout 3.6–3.8; interorbital space 2.5–3.0; depth of caudal peduncle 2.0–2.1. D. III, 7; A. III, 10–11; L. lat. 58–59.

This species is very common at station I.

***Gobio* CUVIER, 1817**

G. *Gobio gobio* (LINNÉ)

Japanese name; *Tairiku-sunamuguri*, Manchurian name; *Hoang-chao-yü*.

Five specimens, total length 110.0–127.0 mm. (5♀), collected station I. Head 3.0–4.0 in body length; depth 4.8–5.4. Eye 4.0–4.8 in head; snout 2.3–2.6; interorbital space 3.3–3.6, depth of caudal peduncle 2.7–3.0. D. III, 7; A. III, 6; L. lat. 43–44.

This species is very common at station I.

***Ladislavia* DYBOWSKI, 1869**

10. *Ladislavia taczanowskii* DYBOWSKI

Japanese name; *Amur-higai*, Manchurian name; *Lo-mu-tsu* (yü).

Ten specimens, total length 35.0–112.0 mm. (5♂, 5♀), collected station I. Head 4.1–4.3 in body length; depth 3.7–4.1. Eye 4.8–5.4 in head; snout 2.8–2.9; depth of caudal peduncle 1.9–2.3. D. III, 7; A. III, 6; L. lat. 40–43 (6/4).

This species is very common at station I.

***Hemibarbus* BLEEKER, 1861**

11. *Hemibarbus labeo* (PALLAS)

Japanese name; *Korai-nigoi*, Manchurian name; *Chung-chen-yü*.

Two specimens, total length 109.0 (♂), 105.0 mm. (♂), collected station I. Head 3.4–3.5 in body length; depth 4.1–4.3. Eye 4.1–4.2 in head; snout 2.5–2.7; interorbital space 3.6–6.1; depth of caudal peduncle 2.8–2.9. D. III, 7; A. III, 6; L. lat. 50–51.

This species is present at station I.

***Hemiculter* BLEEKER, 1860**12. *Hemiculter leucisculus* (BASILEWSKY)

Japanese name; *Kawa-iwasi*, Manchurian name; *Pai-piao-tzu*.

A specimen, total length, 180.0 mm.(♂), collected station I. Head 4.4 in body length; depth 3.8. Eye 3.5 in head; interorbital space 4.8; depth of caudal peduncle 2.1. D. III, 7; A. III, 13; L. lat. 45(9/3). Abdomen, from a little behind the base of pectoral fin to the anus, carinated. Lateral line complete, bending downward nearly to the origin of ventral fin, then running straight to the lower part of the caudal peduncle.

This species is present at station I.

***Rhodeus* AGASSIZ, 1835**13. *Rhodeus sericeus* (PALLAS)

Japanese name; *Yôroppa-tanago*, Manchurian name; *Hu-lu-zu*(yü).

Four specimens, 62.0(♂), 57.0(♂), 54.0(♂), 52.0(♂) mm. collected station I. Head 3.8–4.2 in body length; depth 2.8–2.9. Eye 3.1–3.4 in head; snout 3.0–3.3, interorbital space 2.4–2.9; depth of caudal peduncle 2.0–2.2. D. III, 9; A. III, 8–9; L. lat. 36–37. Lateral line incomplete, and distinct only on several scales anterior part of the body.

This species is common at station I.

Subfamily ***Cobitinae******Cobitis* (ARTEDI) LINNÉ, 1738**14. *Cobitis taenia* LINNAEUS

Japanese name; *Sima-dojô*, Manchurian name; *Chien-lien-yü*.

Four specimens, total length 73.0(♀), 70.0(♂), 66.0(♂), 61.0 mm.(♀), collected station I, II, VII. Head 5.1–5.3 in body length; depth 7.0–7.2. Eye 6.0–6.7; snout 2.1–2.4; interorbital space 7.1–7.7; depth of caudal peduncle 1.9–2.4. D. III, 7; A. III, 5.

This species is very common at station I, II, III, VI, VII.

***Lefua* HERZENSTEIN, 1888**15. *Lefua costata* (KESSLER)

Japanese name; *Hime-dojô*, Manchurian name; *Chien-lien-yü*.

Two specimens, total length 58.0(♀), 45.0 mm.(♀), collected station I, VII. Head 4.2–4.3 in body length; depth 6.0–6.1. Eye 6.0–6.2 in head; snout 2.6–2.9; interorbital space 2.6–3.0; depth of caudal peduncle 2.6–3.0. D. III, 7; A. III, 5.

This species is very common at station I, II, III, VI, VII.

Barbatula LINCK, 179016. *Barbatula toni* (DYBOWSKI)

Japanese name; *Fuku-dojô*, Manchurian name; *Huang-pien-tzu* (yü).

Three specimens, 144.0(♂), 62.0(?), 48.0(?) mm., collected station I, VI, VIII. Head 4.5–4.9 in body length; depth 6.0–6.6. Eye 5.3–5.8 in head; snout 2.2–2.6; interorbital space 3.8–4.4; depth of caudal peduncle 1.9–2.2. D. III, 8; A. III, 5.

This species is very common at station I, VI, VII, VIII (in the stomach of *B. lenok*.).

Family **Siluridae****Parasilurus** BLEEKER, 186317. *Parasilurus asotus* (LINNAEUS)

Japanese name; *Namazu*, Manchurian name; *Nien-yü*.

Two specimens, total length 360.0(♀), 284.0(♀), collected station I, VII. Head 4.4–4.7 in body length; depth 6.0–6.1. Eye 9.3–9.5 in head; snout 4.3–4.5; interorbital space 1.9–2.2; depth of caudal peduncle 3.4–3.5. D. 5; A. 81–83.

This species is very common at station I, VI, VII.

Family **Bagridae****Pelteobagrus** BLEEKER, 186518. *Pelteobagrus ussuriensis* (DYBOWSKI)

Japanese name; *Usuri-gigi*, Manchurian name; *Neu-wei-pa*.

Two specimens, total length 306.0(♀), 302.0(♀) mm., collected station I. Head 4.3–4.5 in body length; depth 5.1–5.5. Eye 8.0–8.8 in head; snout 2.7–3.0; interorbital space 2.5–2.8; depth of caudal peduncle 3.2–3.5. D. I, 7; A. I, 8.

This species is very common at station I and present at VI, VII.

Family **Cottidae****Cottus** (ARTEDI) LINNÉ, 175819. *Cottus poecilopus* HECKEL

Japanese name; *Kajika*.

Five specimens, total length 49.0–72.0 mm. (1♀, 3♂, 1?), collected station II, VI, VII, VIII. Head 3.3–3.8 in body length; depth 4.8–5.3. Eye 4.0–4.4 in head; snout 3.2–3.6; interorbital space 5.3–6.0; depth of caudal peduncle 3.2–3.5. D. VIII, 18; A. 13–14.

This species is very common at station VI, VII, and present at I, II, VIII (in the stomach of *B. lenok*.).

A list of fishes collected from Rin-Ho
(middle reaches of R. Yalu)

Family **Cyprinidae**Subfamily **Cyprininae**

- 1) *Hemibarbus longirostris* (REGAN)
- 2) *Gobio gobio* (LINNAEUS)
- 3) *Pseudogobio esocinus* (TEMMINCK et SCHLEGEL)
- 4) *Pungtungia herzi* HERZENSTEIN
- 5) *Sarcocheilichthys soldatovi* (BERG)
- 6) *Zacco platypus* (TEMMINCK et SCHLEGEL)

Subfamily **Cobitinae**

- 7) *Cabitis taenia* LINNAEUS
- 8) *Lefua costata* (KESSLER)

Family **Anguillidae**

- 9) *Anguilla japonica* (TEMMINCK et SCHLEGEL)

Family **Siluridae**

- 10) *Parasilurus asotus* LINNAEUS

Family **Epiphipelidae**

- 11) *Siniperca scherzeri* STEINDACHNER

Description

Family **Cyprinidae**Subfamily **Cyprininae****Hemibarbus** BLEEKER, 18611. *Hemibarbus longirostris* (REGAN)

Japanese name; *Zunaga-nigoi*.

A specimen, total length 180.0 mm. (♀). Head 4.4 in body length; depth

3.5. Eye 4.2 in head; snout 2.2; interorbital space 3.8; depth of caudal peduncle

3.0. D. III, 7; A. III, 5; L. lat. 43.

Gobio CUVIER, 18172. *Gobio gobio* (LINNAEUS)

Japanese name; *Tairiku-sunamuguri*.

Four specimens, total length 30.0–108.0 mm. (2♀, 2♂). Head 3.5–4.3 in body length; depth 4.7–5.5. Eye 4.0–4.4 in head; snout 2.2–3.1; interorbital space 3.7–4.4; depth of caudal peduncle 2.6–3.0. D. III, 7; A. III, 6; L. lat. 40–42.

Pseudogobio BLEEKER, 18633. *Pseudogobio esocinus* (TEMMINCK et SCHLEGEL)

Japanese name; *Kamatsuka*.

A specimen, total length 225.0 mm. (♀). Head 3.5 in body length; depth

5.5. Eye 5.8 in head; snout 2.1; interorbital space 4.0; depth of caudal peduncle

5.8. D. III, 7; A. III, 6; L. lat. 45.

Pungtungia HERZENSTEIN, 18924. *Pungtungia herzi* HERZENSTEIN

Japanese name; *Mugitsuku*.

A specimen, total length 80.0 mm. (♂). Head 3.9 in body length; depth 3.9. Eye 4.3 in head; snout 2.4; interorbital space 2.3; depth of caudal peduncle 1.9, D. III, 7; A. III, 5; L. lat. 39.

***Sarcocheilichthys* BLEEKER, 1860**

5. *Sarcocheilichthys soldatovi* (BERG)

Japanese name; *Kôrai-higai*.

Six specimens, total length 54.0–160.0 mm. (4, 2). Head 4.0–4.8 in body length; depth 3.3–4.4. Eye 4.0–4.8 in head; snout 2.9–3.3; interorbital space 2.4–2.8; depth of caudal peduncle 1.6–1.8. D. III, 7; A. III, 6; L. lat. 40–41.

***Zacco* JORDAN et EVERMANN, 1902**

6. *Zacco platypus* (TEMMINCK et SCHLEGEL)

Japanese name; *Oikawa*.

Four specimens, total length 77.0–124.0 mm. (2♂, 2♀). Head 3.8–4.0 in body length; depth 3.8–4.1. Eye 3.7–4.0 in head; snout 2.9–3.5; interorbital space 2.6–3.2; depth of caudal peduncle 2.1–2.9. D. III, 7; A. III, 9; L. lat. 44–46.

Subfamily ***Cobitinae***

***Cobitis* (ARTEDI) LINNÉ, 1738**

7. *Cobitis taenia* LINNAEUS

Japanese name; *Sima-dojô*.

Two specimens, total length 70.0 mm. (♀), 66.0 mm. (?). Head 5.1–5.7 in body length; depth 7.5. Eye 7.0–7.3 in head; snout 2.1–2.2; interorbital space 7.0–7.3; depth of caudal peduncle 1.9–2.0. D. III, 7; A. III, 5.

***Lefua* HERZENSTEIN, 1888**

8. *Lefua costata* KESSLER

Japanese name; *Hime-dojô*.

Two specimens, total length 60.0 mm. (♀), 59.0 mm. (♀). Head 4.2–4.3 in body length; depth 6.7–6.8. Eye 8.0 in head; snout 2.4; interorbital space 4.0–4.2; depth of caudal peduncle 2.2. D. III, 7; A. III, 5.

Family ***Anguillidae***

***Anguilla* SHAW, 1804**

9. *Anguilla japonica* (TEMMINCK et SCHLEGEL)

Japanese name; *Unagi*.

Two specimens, total length 520.0 mm., 440.0 mm.

Family *Siluridae*

Parasilurus BLEEKER, 1863

10. *Parasilurus asotus* LINNAEUS

Japanese name; *Namazu*.

A specimen, total length 75.0 mm. Head 3.8 in body length; depth 4.6. Eye 7.2 in head; snout 3.6; interorbital space 2.0; depth of caudal peduncle 5.1. D. 5; A. 85.

Family *Epinephelidae*

Siniperca GILL, 1862

11. *Siniperca scherzeri* STEINDACHNER

Japanese name; *Kôrai-ketzugyo*.

A specimen, total length 292.0 mm. (♂). Head 2.4 in body length; depth 3.4. Eye 6.1 in head; snout 3.6; interorbital space 6.8; depth of caudal peduncle 3.9. D. XII, 12; A. III, 9; L. lat. 108.

The distribution of fishes

1) *Geographical distribution*

According to the previous investigators, the upper reaches of the Sungari makes a corner of southern extremity of Siberian Subregion and the district of the Rin-Ho represents the northern extremity of China Subregion. Though the materials collected are insufficient to discuss thoroughly the geographical distribution of fishes, a clear demarcation line may be so far established between these two districts which have distinct different species respectively.

Judging from the above table (Table I) the upper reaches of the Sungari chiefly produces the fishes of northern type inhabiting Amur district of Siberian Subregion. In these species there are members of fishes belonging to the families peculiar to the Siberian Subregion, such as *Salmonidae*, *Coregonidae*, *Thymallidae*, *Cottidae*, etc.. In the family *Cyprinidae* we also find several northern forms i.e. *Gobio gobio*, *Phoxinus lagowskii*, *P. oxycephalus*, *Barbatula toni*, *Cobitis taenia*, *Rhodeus sericeus*, etc. However a few of the southern types as *Xenocypris*, *Hemiculter*, *Parasilurus* and *Pelteobagrus* are seen in the tributaries. It is highly probable that these southern species had been isolated from south by a great topographical change which occurred in the middle part of Manchuria in the geographical age.

From the above facts it is distinct that the upper reaches of the Sungari belongs to the Siberian Subregion.

MORI has once studied on the fresh water fishes of R. Yalu and stated that the fish fauna of the upper reaches of the Yalu is quite different from that of the middle and lower regions, resembling closely to the fauna of Amur basin. Table II shows the geographical distribution of fishes from the tributaries of

TABLE I. Geographical Distribution of Fishes from the Upper Reaches of Sungari (Above Fu-Sung) × :—The same species + :—The allied species		Upper reaches of R. Yalu	Middle and lower reaches of R. Yalu	River Tunen	River Liao (South Manchuria)	Other reaches of R. Sungari (North Manchuria)
I. Salmonidae						
1)	<i>Hucho taimen</i> (PALLAS)	+	—	—	—	×
II. Coregonidae						
2)	<i>Brachymystax lenok</i> (PALLAS)	×	—	+	—	×
III. Thymallidae						
3)	<i>Thymallus arcticus grubei</i> (DYB.)	+	—	—	—	×
IV. Cyprinidae						
A. Cyprininae						
4)	<i>Cyprinus carpio</i> LINNAEUS	—	×	—	×	×
5)	<i>Carassius auratus</i> (LINNAEUS)	—	×	×	×	×
6)	<i>Phoxinus oxycephalus</i> (BLEEKER)	—	—	—	—	×
7)	<i>Phoxinus lagowskii</i> (DYBOWSKII)	×	×	×	×	×
8)	<i>Xenocypris macrolepis</i> BLEEKER	—	—	—	×	×
9)	<i>Gobio gobio</i> (LINNE)	×	×	×	×	×
10)	<i>Ladislavia taczanowskii</i> (DYB.)	×	×	—	—	×
11)	<i>Hemibarbus labeo</i> (PALLAS)	—	×	—	×	×
12)	<i>Hemiculter leucisculus</i> (BASI.)	—	—	—	×	×
13)	<i>Rhodeus sericeus</i> (PALLAS)	—	—	×	—	×
B. Cobitinae						
14)	<i>Cobitis taenia</i> LINNAEUS	+	+	×	+	×
15)	<i>Lefua costata</i> (KESSLER)	×	×	×	×	×
16)	<i>Barbatula toni</i> (DYBOWSKII)	×	—	×	—	×
V. Siluridae						
17)	<i>Parasilurus asotus</i> (LINNAEUS)	+	×	—	×	×
VI. Bagridae						
18)	<i>Pelteobagurus ussuriensis</i> (DYB.)	—	+	—	×	×
VII. Cottidae						
19)	<i>Cottus poecilopus</i> HECHEL	×	—	×	—	×

TABLE II.

Geographical Distribution of Fishes from the Rin-Ho
(Middle reaches of R. Yalu)

× :—The same species

+ :—The allied species

	Upper reaches of R. Yalu	Upper reaches of R. Sungari	Other reaches of R. Sungari (North Manchuria)	River Tumen	River Liao (South Manchuria)
I. Cyprinidae					
A. Cyprininae					
1) <i>Hemibarbus longirostris</i> (REGAN)	—	—	—	—	×
2) <i>Gobio gobio</i> (LINNAEUS)	×	×	×	×	×
3) <i>Pseudogobio esocinus</i> (TEM. et SCHL.)	×	—	—	—	×
4) <i>Pungtungia herzi</i> HERZENSTEIN	—	—	—	—	—
5) <i>Sarcocheilichthys soldatovi</i> (BERG)	×	—	×	—	—
6) <i>Zacco platypus</i> (TEM. et SCHL.)	—	—	—	—	×
B. Cobitinae					
7) <i>Cobitis taenia</i> LINNAEUS	×	×	×	×	×
8) <i>Lefua costata</i> (KESSLER)	×	×	×	×	×
II. Anguillidae					
9) <i>Anguilla japonica</i> (TEM. et SCHL.)	—	—	—	—	×
III. Siluridae					
10) <i>Parasilurus asotus</i> LINNAEUS	×	×	×	+	×
IV. Epinephelidae					
11) <i>Siniperca scherzeri</i> STEINDACHNER	×	—?	+	—	×

the Rin-Ho (middle reaches of R. Yalu). In this district we find generally the fishes of southern type including Chinese forms, such as *Hemibarbus*, *Pseudogobio*, *Zacco*, *Sarcocheilichthys*, *Anguilla*, *Parasilulus*, *Siniperca*, etc. It is noted, however, a northern representative *Cobitis taenia* and *Pungtungia herzi* which distribute widely in Japan and Chosen were obtained as the only exception.

Therefore it may be said that the tributary of the Rin-Ho (middle reaches of R. Yalu) belongs to the China Subregion.

Studying on the species of the above mentioned two districts it is safely concluded that the zoogeographical line of demarcation of fresh water fishes in Manchuria coincides with the watershed between the Fu-Sung and the Rin-Ho, dividing the R. Yalu at above the Rin-Ho.

2) *Vertical distribution of fishes at Mt. Hakuto*

In this survey, the specimens of fishes at various altitude were collected

separately. The highest point is at station VIII, about 1180 m. above the sea level (upper reaches of Chen-Chiang), whence the following five species; *Hucho taimen*, *Brachymystax lenok*, *Thymallus arcticus grubei*, *Cottus poecilopus* and *Barbatula toni* were obtained. Among the above species only *Thymallus* was found in the brook between station IX-X at altitude about 1400 m. In the muddy brooklet between station VII-VIII at altitude about 1165 m., many specimens of *Poxinus* were found, showing so far the highest habitat of the species. Fishes collected at the conflux point of Man-Chiang and Chen-Chiang station VI at altitude about 1080 m. including ten species of which six species are the same as above mentioned, while the others are *Lefua costata*, *Cobitis taenia*, *Parasilulus asotus* and *Pelteobagrus fluvidraco*. At Fu-Sung, station 1 (430 m.), sixteen species were found in which the above three species of salmonoid fish are not included. The limnological environment at station X (1500 m.) and XI (1780 m.) is conceived to be suited for the fish life, but none of the specimens has been found. The absence of fishes in these tributaries seems to be ascribed to the presence of falls which are numerous on account of the sudden elevation of the land.

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