

## A COLLECTION OF FRESHWATER FISHES FROM THE RAYU BASIN OF WESTERN SARAWAK, MALAYSIA

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**ABSTRACT.** – We surveyed fish fauna in 21 locations over the Rayu River system running through the Kubah National Park, Sarawak. In this study, we recognized 27 species in 18 genera belonging to 13 families. *Ambassis miops* Günther, 1872 and *Stenogobius ingeri* Watson, 1991 were newly recorded. *Pseudomystus rugosus* (Regan, 1913) was rediscovered from Sarawak.

**KEY WORDS.** – Freshwater fish, biodiversity, Sarawak, Borneo.

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### INTRODUCTION

Sarawak, northwestern part of Borneo, is known for unique fish fauna compared with adjacent regions (Kottelat & Whitten, 1996; Doi, 1997). In this area, to clear fish fauna of a mountain river that have a small drainage size, we surveyed fish fauna in 21 locations over the Rayu River, running through the Kubah National Park, Sarawak (1°37'N, 110°09'E). In this survey, we recognized 27 species in 18 genera belonging to 13 families from 6068 specimens. Although fish fauna of Sarawak was summarized by Kottelat & Lim (1995), *Ambassis miops* Günther, 1872 and *Stenogobius ingeri* Watson, 1991 were newly recorded. *Pseudomystus rugosus* (Regan, 1913) was rediscovered from Sarawak.

### MATERIAL AND METHODS

To survey the fish fauna of the Rayu River system, samplings were conducted in 21 sites over the river system from 13 August to 18 September 1998 (Fig. 1). Specimens were

collected by a three-pass electrofishing (300-500 V, AC 90 HZ; Smith-Root Model 15, Vancouver, Washington, USA). To avoid sampling errors, during the electrofishing, 5 mm mesh seines blocked both ends of the sampling site, with more than 30 minutes elapsing between successive passes. Lengths of sampling sites were 25 to 100 m. After fixed in 10 % formalin solution for one week, all specimens were divided in each species, and counted and measured at a field station in the Kubah National Park, Sarawak. Voucher specimens that represent fish communities of the each site were brought to the Center for Ecological Research, Kyoto University, Japan to make critical identifications, and deposited in the Biodiversity Center Sarawak, Malaysia. A substrate type was classified as sand (particle size < 2 mm), gravel (2-16 mm), pebble (17-64 mm), cobble (65-256 mm) boulder (> 256 mm) and bedrock.

### SAMPLING SITES

1. Upper reaches of the Sendok Stream, 5.8 m wide, 30 cm deep and covered with boulders and cobbles. Water

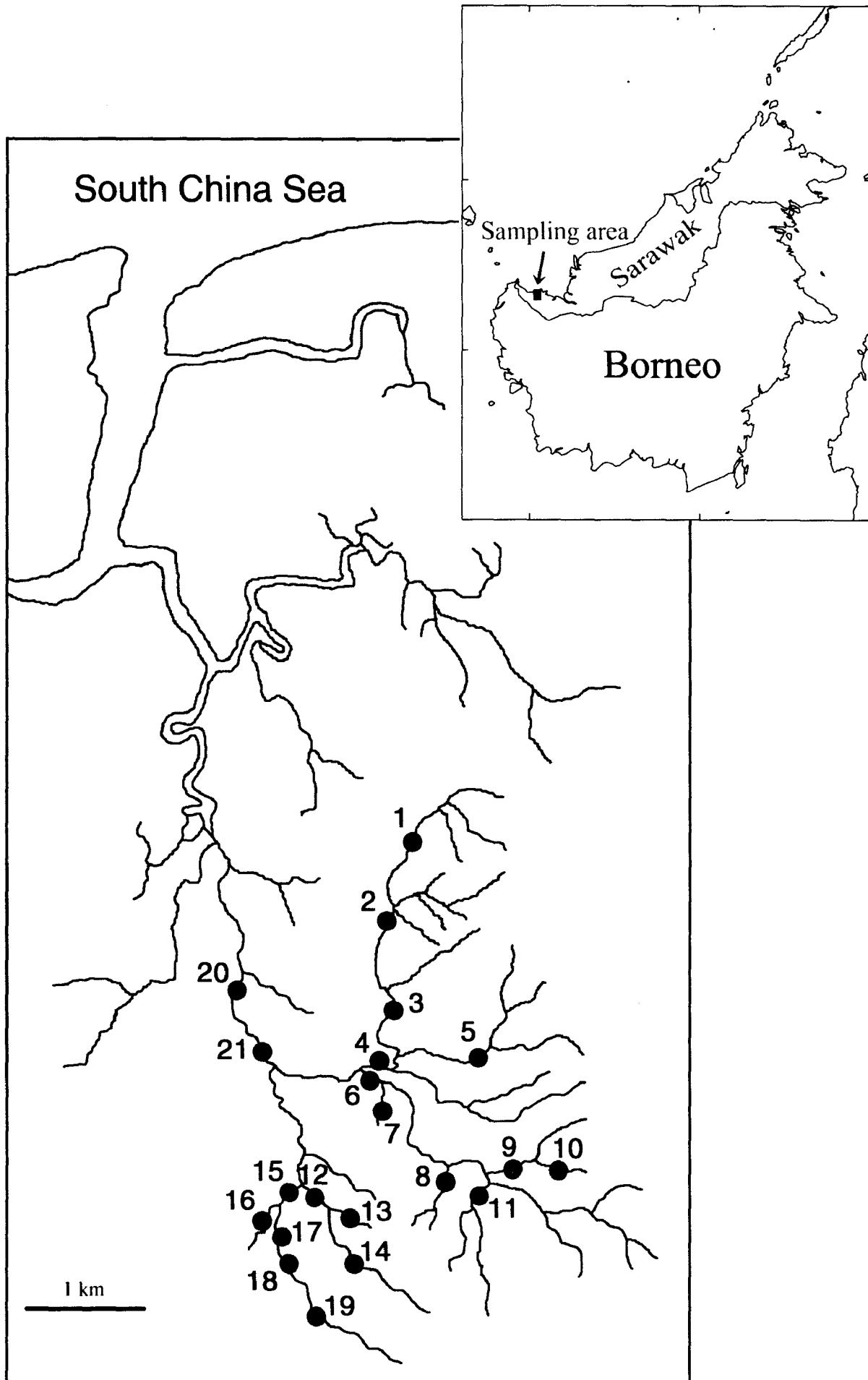


Fig. 1. Map of drainage network of the Rayu River system, with sampling sites (1-21; see text).

- temperatures 23.9-26.1 °C, pH 7.0 and electric conductivity (EC) 26 µs/cm. 14 Sep.1998.
2. Upper middle reaches of the Sendok Stream, 5.3 m wide, 30 cm deep and covered with sand. Water temperatures 23.0-25.9 °C, pH 6.6 and EC 20µs/cm. 16 Sep.1998.
  3. Lower middle reaches of the Sendok Stream, 4.8 m wide, 35 cm deep and covered with sand and gravels. Water temperatures 23.7-25.7 °C, pH 6.6 and EC 17µs/cm. 16 Sep.1998.
  4. Lower reaches of the Sendok stream, 5.5 m wide, 35 cm deep and covered with cobbles, boulder and pebble. Water temperatures 24.0-26.0 °C, pH 6.6 and EC 18µs/cm. 14 Aug.1998.
  5. Middle reaches of the Ingka Stream, 4.8 m wide, 30 cm deep and covered with boulder and cobbles. Water temperatures 23.3-26.3 °C, pH 7.0 and EC 11µs/cm. 15 Sep.1998.
  6. Main stream of the Rayu River, 8.5 m wide, 45 cm deep and covered with pebble, cobbles, boulder and pebble. Water temperatures 23.0-27.0 °C, pH 6.6 and EC 17µs/cm. 3-4 Sep.1998.
  7. Batu Stream tributary to the Rayu River, 3.0 m wide, 20 cm deep and covered with sand and pebble. Water temperatures 23.7-25.2 °C, pH 6 and EC 12µs/cm. 18 Aug.1998.
  8. Isu Stream tributary to the Rayu River, 4.5 m wide, 15 cm deep and covered with cobbles, pebble and boulder. Water temperatures 23.0-25.0 °C, pH 6.7 and EC 15µs/cm. 15 Sep.1998.
  9. Megong Stream tributary to the Rayu River, 5.5 m wide, 25 cm deep and covered with boulder and cobbles. Water temperatures 22.0-24.0 °C, pH 6.9 and EC 25µs/cm. 17 Aug.1998.
  10. Kamantan Stream tributary, 3.4 m wide, 8 cm deep and covered with boulder and cobbles. Water temperatures 22-24 °C, pH 7.3 and EC 43µs/cm. 10 Sep.1998.
  11. Entawa Stream tributary to the Rayu River, 3.8 m wide, 30 cm deep and covered with boulder and cobbles. Water temperatures 23-24 °C, pH 6.8 and EC 17µs/cm. 17 Sep.1998.
  12. Lower reaches of the Nansang Stream, 3.7 m wide, 40 cm deep and covered with sand and gravels. Water temperatures 23.0-25.5 °C, pH 6.7 and EC 27µs/cm. 22 Aug.1998.
  13. Sengajong Stream tributary to the Nansang Stream, 2.1 m wide, 20 cm deep and covered with sand and bedrocks. Water temperatures 24.3-26.3 °C, pH 6.6 and EC 21µs/cm. 11 Sep.1998.
  14. Upper reaches of the Nansang Stream, 4.2 m wide, 15 cm deep and covered with boulder and pebble. Water temperatures 23.7-25.6 °C, pH 6.8 and EC 25µs/cm. 7 Sep.1998.
  15. Middle reaches of the Amok Stream, 7.1 m wide, 45 cm deep and covered with pebble and sand. Water temperatures 23.4-25.2 °C, pH 6.9 and EC 31µs/cm. 21 Aug.1998.
  16. Upper reaches of the Amok Stream, 4.7 m wide, 30 cm deep and covered with sand. Water temperatures 23.0-25.8 °C, pH 7.0 and EC 32µs/cm. 27 Aug.1998.
  17. Lower reaches of the Buloh Stream, 3.7 m wide, 20 cm deep and covered with pebble and sand. Water temperatures 23.5-26.0 °C, pH 6.8 and EC 24µs/cm. 26 Aug.1998.
  18. Middle reaches of the Buloh Stream, 3.9 m wide, 20 cm deep and covered with pebble and sand. Water temperatures 24.0-25.9 °C, pH 6.7 and EC 26µs/cm. 26 Aug.1998.
  19. Upper reaches of the Buloh Stream, 2.9 m wide, 15 cm and covered with boulder and pebble. Water temperatures 23.8-25.4 °C, pH 6.9 and EC 26µs/cm. 11 Sep.1998.
  20. Main stream of the Rayu River. 25 Aug.1998. Fishes were collected by local fishermen.
  21. Main stream of the Rayu River, 15 m wide, 80 cm deep and covered with pebble and gravels. 27 Aug.1998. Fishes were collected by local fishermen.

## TAXONOMY

### FAMILY CYPRINIDAE

#### 1. *Cyclocheilichthys armatus*

(Valenciennes in Cuvier & Valenciennes, 1842)

23 ex. (2.9-10.1 cm SL): 1, 3, 7, 13, 14. [number of examples (size range): sampling sites]

#### 2. *Puntius binotatus*

(Valenciennes in Cuvier & Valenciennes, 1842)

90 ex. (1.4-8.9 cm SL): 1, 2, 3, 4, 5, 6, 8, 12, 13, 16, 17, 18, 19, 20, 21.

#### 3. *Puntius everetti* (Boulenger, 1894)

340 ex. (1.4-7.8 cm SL): 1, 2, 3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 16, 17, 18, 19, 20, 21.

#### 4. *Puntius kuchingensis* Herre, 1940

581 ex. (1.3-11.6 cm SL): 1, 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 16, 18, 19, 20.

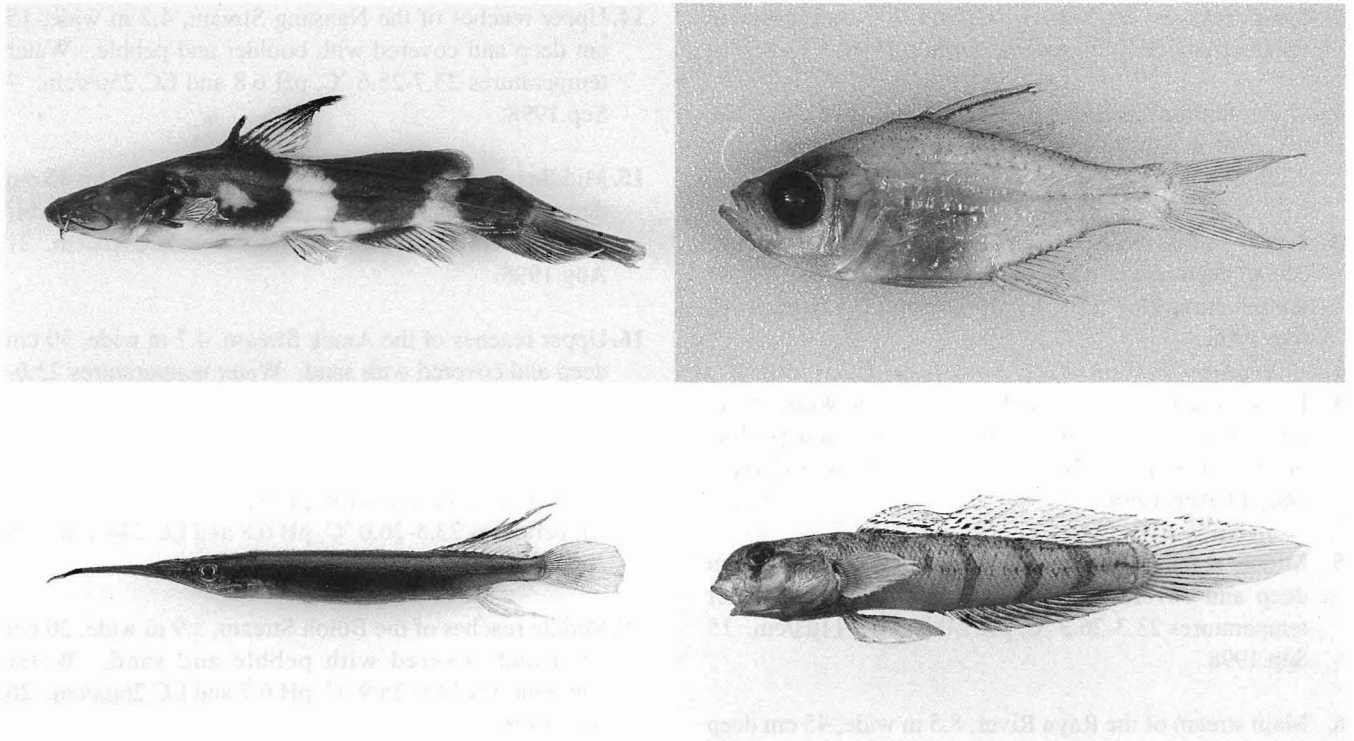


Fig. 2. Left top: *Leiocassis rugosus*, 100.2 mm SL; left bottom: *Dermogenys* species undetermined, 42.6 mm SL; right top: *Ambassis miops*, 23.0 mm SL; right bottom: *Stenogobius ingeri*, 67.9 mm SL.

**5. *Puntius sealei* (Herre, 1933)**

1 ex (8.4 cm SL): 13.

**6. *Rasbora caudimaculata* Volz, 1903**

95 ex. (1.6-9.9): 5, 6, 8, 20, 21.

**7. *Rasbora kalochroma* (Bleeker, 1851)**

8 ex. (4.0-4.9 cm SL): 20.

**8. *Rasbora sarawakensis* Brittan, 1951**

2365 ex. (1.0-7.6 cm SL): 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 19, 21.

**9. *Rasbora sumatrana* (Bleeker, 1852)**

26 ex. (1.9-7.7): 2, 13, 15, 16, 17, 18, 20.

FAMILY BAGRIDAE

**10. *Pseudomystus rugosus* (Regan, 1913)?(Fig. 2)**

8 ex. (8.2-12.7 cm SL): 1, 5.

FAMILY CLARIIDAE

**11. *Clarias planiceps* Ng, 1999**

17 ex. (6.2-17.3 cm SL): 1, 4, 6, 8, 10, 11, 13, 14, 18, 19, 20.

FAMILY HEMIRAMPHIDAE

**12. *Dermogenys* species undetermined (Fig. 2)**

3 ex. (3.8-4.4 cm SL): 21.

**13. *Hemirhamphodon kuekenthali* Steindachner, 1901**

1680 ex. (1.0-8.7 cm SL): 1, 2, 3, 4, 5, 6, 7, 8, 12, 13, 14, 15, 16, 17, 18, 19, 21.

FAMILY SYNBRANCHIDAE

**14. *Monopterus albus* (Zuiew, 1793)**

3 ex. (18.5-26.5 cm TL): 1, 4.

FAMILY CHANDIDAE

**15. *Ambassis miops* Günther, 1872 (Fig. 2)**

1 ex. (2.4 cm SL): 20.

FAMILY NANDIDAE

**16. *Nandus nebulosus* (Gray, 1835)**

13 ex. (2.5-6.3 cm SL): 3, 6, 20.

FAMILY GOBIIDAE

**17. *Brachygobius doriae* (Günther, 1868)**

5 ex. (1.7-2.1 cm SL): 20.

**18. *Glossogobius giuris* (Hamilton, 1822)**

6 ex. (5.1-10.9 cm SL): 4, 12, 16, 20, 21.

**19. *Pseudogobiopsis* species undetermined**

601 ex. (1.7-4.8 cm SL): 1, 2, 3, 4, 5, 6, 8, 13, 14, 15, 16, 17, 18, 19, 20, 21.

**20. *Stenogobius ingeri* Watson, 1991 (Fig. 2)**

14 ex. (4.7-6.8 cm SL): 21.

FAMILY ANABANTIDAE

**21. *Anabas testudineus* (Bloch, 1795)**

1 ex. (6.6 cm SL): 20.

FAMILY BELONTIIDAE

**22. *Betta akarensis* Regan, 1910**

108 ex. (1.6-7.3 cm SL): 1, 5, 7, 8, 9, 10, 11, 14, 20.

FAMILY LUCIOCEPHALIDAE

**23. *Luciocephalus pulcher* (Gray, 1830)**

20 ex. (3.2-11.4 cm SL): 1, 2, 3, 4, 5, 7.

FAMILY CHANNIDAE

**24. *Channa gachua* (Hamilton, 1822)**

2 ex. (12.8-14.0 cm SL): 20.

**25. *Channa lucius***

(Cuvier in Cuvier & Valenciennes, 1831)

14 ex. (5.3-27.5 cm SL): 2, 3, 4, 5, 6, 12, 13, 14, 17.

**26. *Channa striata* (Bloch, 1793)**

5 ex. (10.7-15.1 cm SL): 10, 20.

FAMILY MASTACEMBELIDAE

**27. *Macrognathus maculatus***

(Cuvier in Cuvier & Valenciennes, 1832)

38 ex. (6.7-23.2 cm SL): 1, 4, 5, 6, 8, 9, 10, 11, 14.

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