



## ***Balantiocheilos ambusticauda*, a new and possibly extinct species of cyprinid fish from Indochina (Cypriniformes: Cyprinidae)**

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### **Abstract**

*Balantiocheilos ambusticauda* **sp. nov.** is described from the Mekong and Chao Phraya river drainages in Indochina (mainland Southeast Asia). It can be distinguished from its only congener, *B. melanopterus*, in having a shorter snout (27.5–33.9% HL vs. 33.2–39.1), posteriorly directed grooves at rictus curved (vs. straight), and narrower black margins on the pelvic and anal fins (on distal third or less vs. on distal half or more). The possibility that *B. ambusticauda* is extinct is also discussed.

**Key words:** Mekong, Chao Phraya, Systomini, Osteobrama

### **Introduction**

Cyprinid fishes of the genus *Balantiocheilos* Bleeker, 1860 (type species *Barbus melanopterus* Bleeker, 1851) are easily distinguished from other members of the family by the presence of thick and fleshy lips, the lower lip bearing a large lobe that is deeply incised medially along its posterior edge and black along the distal margins of the dorsal, caudal, anal and pelvic fins. The posterior margin of the lower lip has often been described as forming a posteriorly opening pouch or pocket between the lip and the skin of the throat (e.g., Bleeker, 1863–64: 27, 80; Weber & de Beaufort, 1916: 205; Smith, 1945: 206; Kottelat *et al.*, 1993: 29, 110). To date, the genus has been considered monotypic and found only in river drainages of Sundaic and mainland Southeast Asia (Indochina). *Balantiocheilos hekouensis* Wu, in Wu *et al.*, 1977 is a synonym of *Paraspinibarbus macracanthus* (Pellegrin & Chevey, 1936) (Chu & Kottelat, 1989).

A comparison between Indochinese and Sundaic specimens previously thought to be conspecific with *B. melanopterus* shows that two distinct species can be recognized, with the Indochinese specimens representing a new species described herein as *Balantiocheilos ambusticauda*.

### **Materials and methods**

Measurements were made point to point with dial callipers and data recorded to 0.1 mm. Counts and measurements were made on the left side of specimens whenever possible. Subunits of the head are presented as proportions of head length (HL). Head length itself and measurements of body parts are given as proportions of

standard length (SL). Measurements and counts were made following Hubbs & Lagler (1947), except for notation of scale and fin-ray counts, which follow those of Kottelat (1990, 2001), and pharyngeal teeth counts, which follow those of Jenkins & Burkhead (1994). Vertebral counts follow Siebert & Richardson (1997) and are expressed as abdominal + caudal vertebrae (caudal vertebrae are those with closed hemal arches), with the first post-Weberian centrum counted as the fifth vertebra. Fin rays were counted under a binocular dissecting microscope using transmitted light.

Material for this study is deposited in the following institutions: Academy of Natural Sciences, Philadelphia (ANSP), California Academy of Sciences, San Francisco (CAS), Muséum d'Histoire Naturelle, Geneva (MHNG), Muséum National d'Histoire Naturelle, Paris (MNHN), Museum of Zoology, University of Michigan, Ann Arbor (UMMZ), and the Zoological Reference Collection, Raffles Museum of Biodiversity Research, Singapore (ZRC).

***Balantiocheilos ambusticauda* sp. nov.**

(Fig. 1a)

*Balantiocheilos melanopterus* (non Bleeker) Bleeker, 1865a: 35; 1865b: 176; Sauvage, 1881: 164; Tirant, 1885: [p. 161 of 1929 reprint]; Hora, 1923: 159; Chevey, 1932: 14; Fowler, 1937: 200, Figs. 185–186; Smith, 1945: 206; Taki, 1968: 10; Kottelat, 1985: 260; Rainboth, 1996: 86; Baird *et al.*, 1999: 25; Kottelat, 2001: 38 (not figure [a cultivated specimen]).

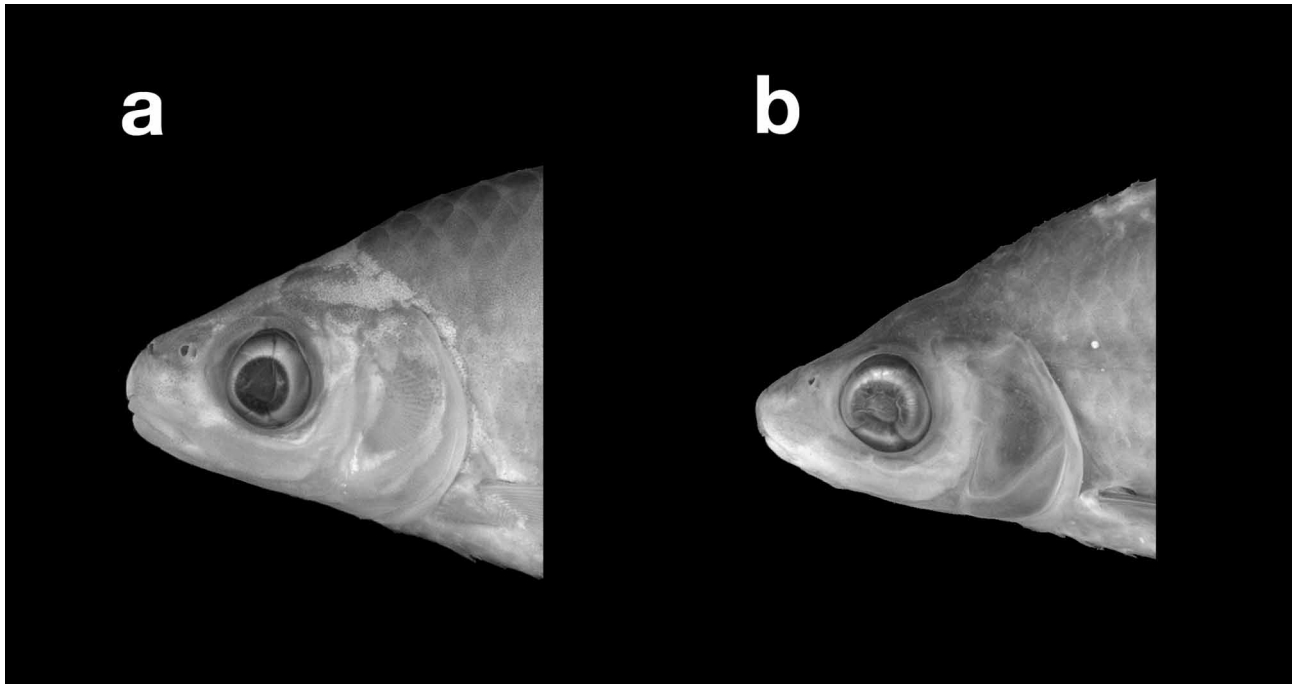
**Type material.** *Holotype*. MHNG 2689.096, 105.1 mm SL; Thailand: Nakhon Sawan province, Bung Bora-pet; R. Geisler, February 1967.



**FIGURE 1.** Lateral views of: a. *Balantiocheilos ambusticauda*, holotype, MHNG 2689.096, 105.1 mm SL; b. *Balantiocheilos melanopterus*, ZRC 8145, 116.2 mm SL. Figures not to scale.

*Paratypes.* MHNG 2158.45 (3), 102.4–120.9 mm SL; data as for holotype. ANSP 87831 (3), 52.6–54.6 mm SL; Thailand: Kemrat, 16°2'N 105°12'E; R. de Schauensee, 1936. ANSP 87209 (2), 110.0–116.6 mm SL; Thailand: Bangkok; R. de Schauensee, 1936. MNHN A6333 (1), 126.0 mm SL; Thailand: Chao Phraya River; M. Harmand, 1883. MNHN 1847 (5), 78.6–107.5 mm SL; Thailand: Bangkok; F. Bocourt, 1862.

**Diagnosis.** *Balantiocheilos ambusticauda* is distinguished from its sole congener, *B. melanopterus* (Fig. 1b), in having a shorter snout (27.5–33.9% HL vs. 33.2–39.1) that is rounded (vs. obliquely truncate) in specimens larger than ca. 80 mm SL (Fig. 2), posteriorly directed groove at rictus curved (vs. straight; Fig. 3), and narrower black margins on the pelvic and anal fins (on distal third of both fins or less vs. on distal half or more, with pelvic fins sometimes entirely black).



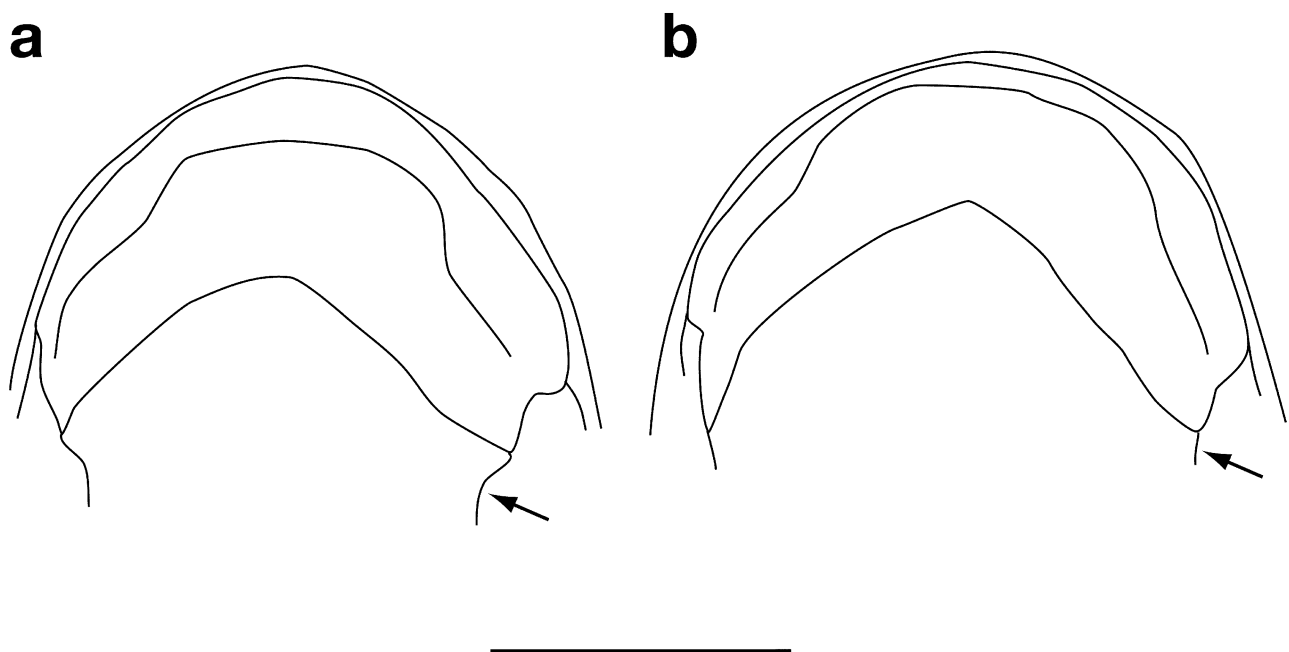
**FIGURE 2.** Lateral view of snouts of: a. *Balantiocheilos ambusticauda*, MHNG 2689.096, 105.1 mm SL; b. *B. melanopterus*, ZRC 8145, 116.2 mm SL.

**Description.** Morphometric data are given in Table 1. Body moderately slender and strongly compressed; scales in transverse lines  $\frac{1}{2}5/1/4\frac{1}{2}$  (1) or  $\frac{1}{2}6/1/4\frac{1}{2}$  (8). Predorsal profile gently sloping dorsally, then sloping gently ventrally from origin of dorsal fin to end of caudal peduncle; predorsal scales 11 (6) or 12 (3). Ventral profile less convex than dorsal profile, sloping gently ventrally to anal-fin origin, then sloping more steeply dorsally from there to end of caudal peduncle. Lateral line complete, with 32+2 (6), 33+2 (2) or 34+3 (1) scales. Scales with strongly convergent radii. Vertebrae 17+14=31 (1), 18+14=32 (4), 17+16=33 (2) or 18+15=33 (2).

Head narrow, snout produced, with a rounded tip. Nostrils small and situated in front of eye. More than 50% of eye in anterior half of head, visible from ventral, but not dorsal, aspect. Suborbital bones fairly large, narrowest directly below eye. Mouth subterminal, with well-developed groove separating lips from both upper and lower jaws. Lips thick and fleshy, with numerous longitudinal striae. Upper lip produced, entirely visible from below when mouth is closed. Lower lip with prominent lobe produced posteriorly; lobe deeply incised medially to form chevron-shaped posterior margin, and with short, curved groove extending posteriorly at rictus (Fig. 3). Gill membranes separate at isthmus. First gill arch with 4+7 (3), 5+10 (4) or 6+10 (2) rakers. Gill rakers short, 25% length of opposing filaments on epibranchial and 20% length of opposing filaments on ceratobranchial. Pharyngeal bones stout, with three rows (2,3,5–5,3,2) of hook-shaped, conical teeth.

**TABLE 1.** Morphometric data for *Balantiocheilos ambusticauda* (n=9: 52.6–120.9 mm SL) and *B. melanopterus* (n=18: 63.6–177.4 mm SL).

	<i>B. ambusticauda</i>	<i>B. melanopterus</i>
In %SL		
Head length	24.8–28.1	24.2–30.0
Head width	13.3–15.5	14.1–15.5
Body depth at dorsal origin	26.0–33.7	31.1–32.7
Predorsal length	47.5–52.3	49.9–51.3
Preanal length	72.7–78.1	76.7–78.4
Prepelvic length	48.6–52.1	48.8–51.6
Length of dorsal-fin base	14.6–18.4	15.7–18.5
Anal-fin length	9.5–10.7	8.7–10.3
Pelvic-fin length	19.2–23.9	19.2–24.5
Pectoral-fin length	19.2–21.6	20.5–22.2
Caudal-fin length	27.4–36.8	35.2–40.4
Length of caudal peduncle	16.2–19.5	16.2–19.3
Depth of caudal peduncle	10.6–12.3	10.2–13.9
In %HL		
Snout length	27.5–33.9	33.2–39.1
Interorbital distance	31.1–45.2	35.2–43.2
Eye diameter	25.4–33.0	25.0–30.3



**FIGURE 3.** Ventral views of mouths of: a. *Balantiocheilos ambusticauda*, MHNG 2158.45, 120.9 mm SL; b. *B. melanopterus*, CAS-SU 34658, 133.8 mm SL. Posteriorly directed grooves at rictus indicated with arrows.

Dorsal fin moderately high, with  $ii, 8\frac{1}{2}$  (9) rays and concave distal margin, sharply pointed at apex; origin slightly anterior to pelvic-fin origin. Tip of adpressed dorsal fin reaching vertical through base of first anal-fin ray. Last unbranched ray longest, osseous proximally; spinous part with 12–15 serrations on posterior edge.

Pectoral fin long, with i,12,i (1), i,13,i (4) or i,14,i (4) rays and extending almost to pelvic-fin origin (reaching to 1–2 scale rows anterior to pelvic-fin origin); distal margin slightly convex. Pelvic fin with i,8 (1); i,8,i (1) or i,9 (7) rays, extending to slightly more than midway between pelvic-fin origin and anterior part of anal-fin base; distal margin slightly convex. Anal fin with ii,5½ (9) rays, strongly concave distal margin and last three posterior rays approximately equal in length; when adpressed against body, extending to middle of caudal peduncle. One scale row between urogenital opening and anal-fin origin. Caudal peduncle strongly compressed and moderately long; circumpeduncular scales ½3/1/3½ (9). Caudal fin deeply forked, with i,8,8,i (1) or i,9,8,i (8) rays. Upper and lower caudal lobes pointed; lower lobe slightly longer than upper.

Pronounced sexual dimorphism absent. Breeding tubercles absent and body depth between sexes not different.

**Coloration.** Preserved material with a brown body and head. Dorsal, anal and caudal fins hyaline with a thick black margin band. Proximal anterior part of dorsal fin dark brown. Dorsal and ventral margins of upper and lower caudal fin lobes with faint dark band in some individuals. Posterior third of pelvic fin black. Pectoral fin hyaline.

**Distribution.** Lower and middle Mekong and Chao Phraya river drainages in mainland Southeast Asia (Fig. 4). The original distribution of this species included the Chao Phraya River drainage from Bangkok upriver to the lower Nan River (Smith, 1945) and in the Mekong from Vietnam and the Great Lake (Tonle Sap) to the lower Nam Ngum River (Taki, 1968). The specimen identified as *Balantiocheilus* from Chiangmai by Fowler (1934: 127) is actually a juvenile *Poropuntius*.

**Etymology.** The name of this species comes from the Latin *ambustus* (burned around, scorched) and *cauda* (tail), in allusion to the black edge of the caudal fin. This name evokes the Thai name for the fish (pla hang mai, meaning “burnt tail fish”; Smith, 1945: 206). A noun in apposition.

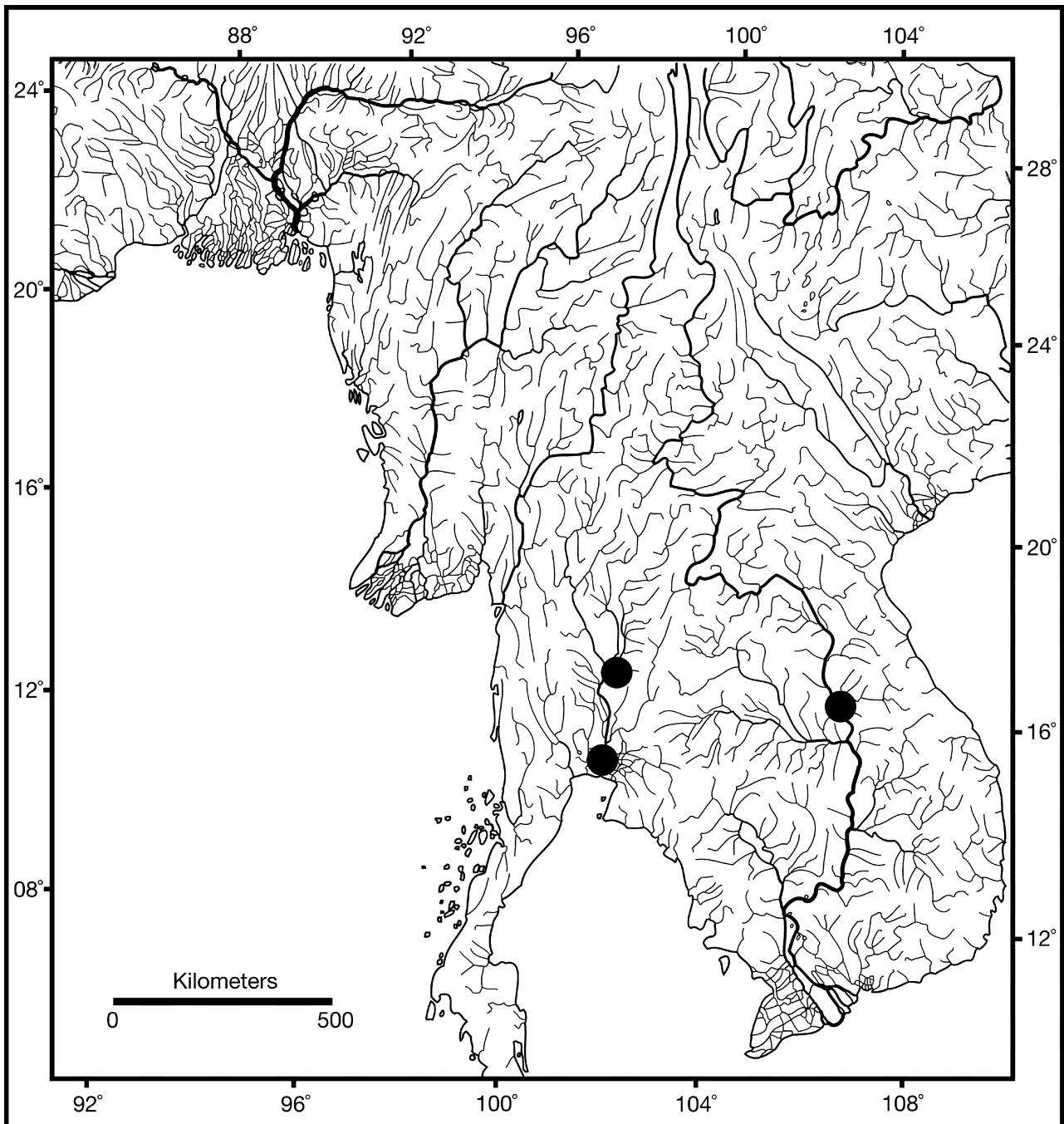
## Discussion

The characters distinguishing *B. ambusticauda* from *B. melanopterus* are listed under the diagnosis. The difference in snout length between *B. ambusticauda* and *B. melanopterus* cannot be explained by ontogeny alone. Analysis of the plots of snout length against SL for both species (Fig. 5) shows that the regression lines are significantly different (ANCOVA,  $P < 0.001$ ). The differences in snout length are also marked enough to result in slightly different snout shapes that are apparent in larger specimens (Fig. 2): *B. ambusticauda* has a deeper, more rounded snout than that of *B. melanopterus*. We note, however, that the difference is not obvious in specimens ca. 50–60 mm SL. Even so, this difference is consistent enough to warrant the use of snout length as a diagnostic character.

Besides the differences in fin color, the live coloration of *B. ambusticauda* also appears to differ slightly from that of *B. melanopterus*. A photograph of live *B. ambusticauda* appearing in a Thai children's magazine circa 1970 shows some golden color on the dorsal surfaces of the head and body (C. Vidthayanon, pers. comm.), and there are unsubstantiated reports that the fish is an overall golden color (*B. melanopterus* in contrast is an overall silver color in life and does not show any evidence of a gold color on the body in life). *Balantiocheilus ambusticauda* is also apparently a smaller species than *B. melanopterus*, reaching only to 20 cm TL (Smith, 1945: 205), versus to 35 cm TL for the latter species (Weber & de Beaufort, 1916: 206).

*Balantiocheilus ambusticauda* is possibly extinct. This is said to be due to excessive harvesting for the aquarium-fish trade (Humphrey & Bain, 1990) but there is no data supporting this claim. In 1980, fisheries biologists in Thailand were already considering it extirpated and by that time all *Balantiocheilus* exported from Thailand for the aquarium trade were already captive-bred *B. melanopterus* originating from Indonesian stock. Rainboth (1996) records this species (as *B. melanopterus*) as occurring "...in a few rivers flowing through relatively pristine inundated forest at the eastern end of the Great Lake...", but we did not locate mate-

rial to substantiate this. We also could not obtain information through the aquarium trade on its possible survival in Tonle Sap. The most recent specimens collected were possibly the type series. Although Rainboth *et al.* (1976) recorded this species from the Mekong, their records were based on literature and no specimens of *Balantiocheilos* were obtained during an extensive survey of the middle and lower Mekong River carried out in the late 1960s and early 1970s by the University of Michigan (all of the material from these surveys are deposited in UMMZ). There are two recent Vietnamese reports (Nguyen & Nguyen, 2005; Tong & Nguyen, 2005), which record *Balantiocheilos* from the Saigon River and Ca Mau province (in the Dong Nai and Mekong River drainages respectively). We were unable to obtain information as to whether or not these records were based on material collected or on the literature, nor were we able to examine the material (if any) to ascertain their identity. If based on actual specimens of *Balantiocheilos*, these records most likely refer to *B. ambusticauda*.



**FIGURE 4.** Map showing collection localities of *Balantiocheilos ambusticauda* material examined in this study.

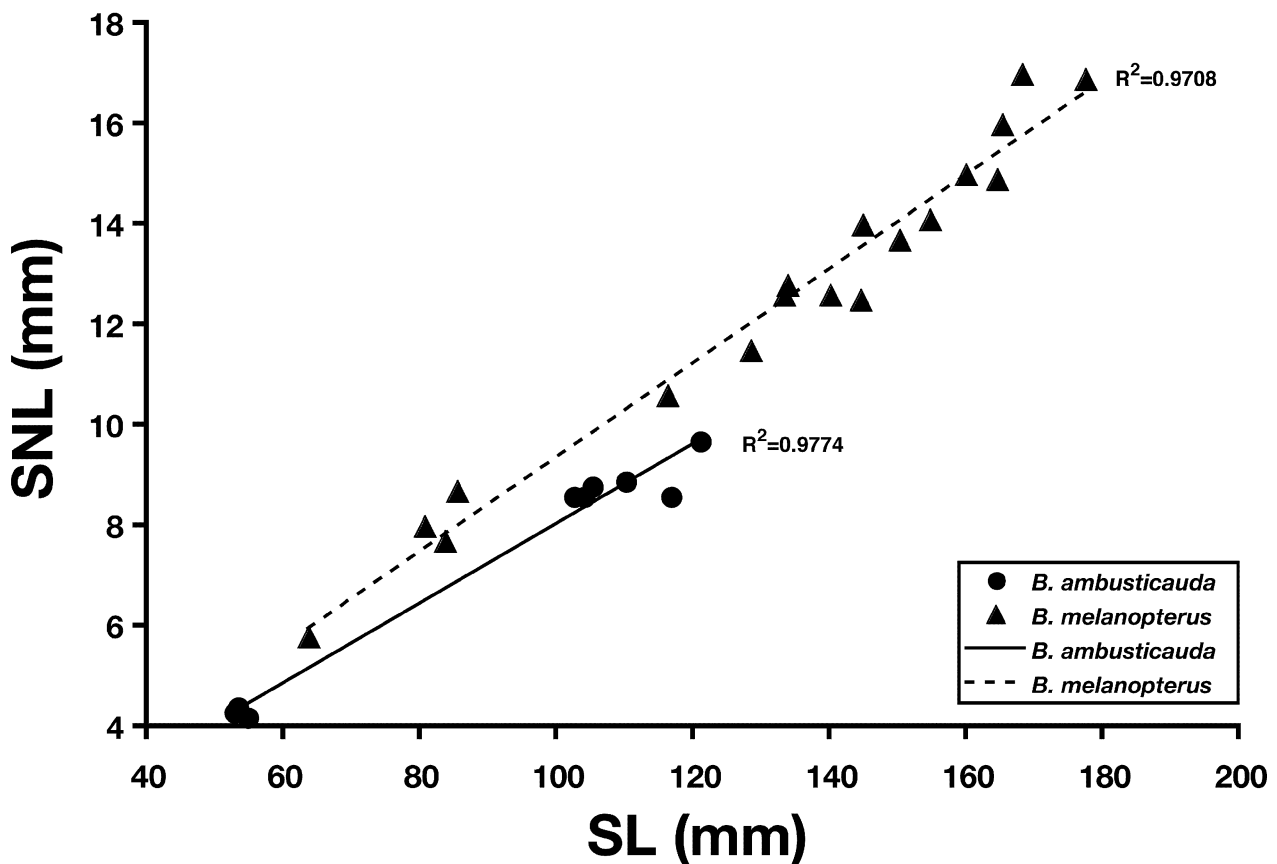


FIGURE 5. Snout length (SNL) plotted against standard length for *Balantiocheilos* species.

It is noteworthy that the *B. melanopterus* populations in other parts of Southeast Asia also seem to have sharply declined or disappeared in recent years. In Danau Sentarum (Borneo), fishermen already reported in 1993 and 1995 that the populations have decreased dramatically after 1975, for no clear reason. Fishermen mentioned overfishing for the aquarium-fish trade or forest fires in 1975 and the resulting pollution as possible causes (Kottelat & Widjanarti, 2005). The species is apparently extirpated in the Batang Hari basin (Sumatra) (H. H. Tan, pers. comm.) and it seems that all individuals of *B. melanopterus* exported from Indonesia and Thailand by the aquarium-fish trade are captive bred (Kottelat & Widjanarti, 2005).

### Comparative material

*Balantiocheilos melanopterus*: CAS 49188 (3), 80.6–133.3 mm SL; Borneo: Kalimantan Barat, lower part of Sungai Kebian, a large forested stream flowing into Kapuas mainstream 5 km upstream from confluence of Sungai Melawi, 0°7'N 111°32'E. CAS-SU 34658 (8), 133.8–168.1 mm SL; ZRC 1767 (2), 144.5–177.4 mm SL; ZRC 2138 (2), 63.6–140.0 mm SL; Malaysia: Perak, Chenderoh Dam. UMMZ 70662 (1), 85.4 mm SL; Sumatra: Jambi. UMMZ 155659 (1), 128.4 mm SL; Sumatra: Palembang. ZRC 8145 (1), 116.2 mm SL; Malaysia: Pahang, Tasek Chini.

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