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Original Article

A re-examination of 53 type specimens of Thai fishes described by Hugh McCormick Smith and in the collection of the Smithsonian Institution

Veera Vilasri[1], Pichai Sonchaeng [2,3], Sandra Raredon[4], Toshio Kawai[5] and Tanya Chan-ard [1]

[1] Natural History Museum, National Science Museum, Thailand, Technopolis, Khlong 5, Khlong Luang, Pathumthani 12120 Thailand
[2] Ocean College, Zhejiang University, Zijingang Campus, 866 Yuhangtang Road, Hangzhou, 310058, China
[3] Faculty of Marine Technology, Burapha University, Chon Buri Campus, 169 Longhaad Bangsaen Road, Saensook, Mueang, Chon Buri 20131 Thailand
[4] Department of Vertebrate Zoology, Division of Fishes, National Museum of Natural History, Smithsonian Institution, PO Box 37012, MRC 159, Washington DC 20013-7012, U.S.A.
[5] Faculty of Fisheries Sciences, Hokkaido University, 3-1-1 Minato-cho, Hakodate, Hokkaido 041-8611, Japan

ABSTRACT: Dr. Hugh McCormick Smith (1865-1941) was an American ichthyologist who lived and worked in Thailand during 1923-1935 as a special fisheries advisor to the Siam (Thai) Government. Based on his work, three important scientific papers were published during 1931-45 describing 62 new species of ichthyofauna. Most of Smith's type specimens have been deposited in the Smithsonian Institution, U.S.A., while a few are in Thailand at the Kasetsart University Museum of Fisheries. The present study, conducted during a visit to the Smithsonian Institution in May 2013, documents 53 of Smith's primary types held at the Smithsonian Institution.

KEY WORDS: Hugh McCormick Smith, primary types, Thai fishes, Smithsonian Institution.

INTRODUCTION

Dr. Hugh McCormick Smith was an American ichthyologist who lived in the Kingdom of Siam (now Thailand) from 1923 to 1935 to study and work on fishes and fisheries (Fig. 1). In 1923, after Dr. Smith resigned from the United States Fisheries Service, he was invited by the Royal Government of Siam as a special advisor to study and help in the development of the country's fisheries. He organized the country's fishery service and three years later became the first director of the Siamese Department of Fisheries. During his work, he visited many parts of Thailand and was able to collect and study large number of fish specimens. In June 1923, immediately after arriving in Thailand, he travelled to the mouths of the Chao Phraya, Tha Chin and Meklong Rivers. In 1924 and 1926, he visited Koh Chang, a large mountainous island situated off Thailand's southeast coast in the Gulf of Thailand. Over the next ten years, he travelled to many regions on the mainland from Pattani in the south to the northern border, including the eastern, southeastern, and southwestern parts of the country. He visited many of the

*Corresponding author.
E-mail: veera@nsm.or.th

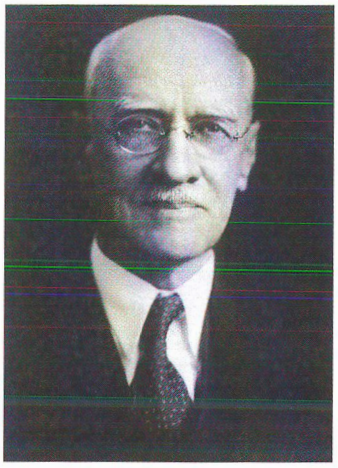


Figure 1. Photograph of Dr. Hugh McCormick Smith. Photo credit: the Special Collections and Archives, University of California, San Diego (2017).

localities more than once (Schultz, 1941). During his travels, he collected many fishes, and his collection together with specimens collected by the Siamese Department of Fisheries, the Royal Forest Department and National Scout Organization, were divided into two groups. The main group was sent to the U.S. National Museum (now the Smithsonian Institution, USNM), and the remaining specimens were deposited at the Siamese Department of Fisheries and subsequently transferred to the Kasetsart University Museum of Fisheries (KUMF) (Vidthayanon *et al.*, 1997). After he returned to the United States in 1935, Dr. Smith was appointed an associate curator at the Department of Zoology at the Smithsonian, where he spent the next six years writing a monograph on Thai fishes. On September 28, 1941, he died suddenly of a heart attack. At the time of his death, his monograph was unfinished, but it was completed and published four years later by Leonard P. Schultz (Smith, 1945).

Based on his work in Thailand, three important scientific papers describing new species were published during 1931-45. The first two are "Descriptions of new genera and species of Siamese fishes" (Smith, 1931) and "Contributions to the ichthyology of Siam. IX-XIX" (Smith, 1934), which contained descriptions of 33 and 12 new species, respectively. The type specimens were collected mostly by Smith and his assistants of the Siam governmental service during 1923-34. His posthumous monograph "The Freshwater Fishes of Siam or Thailand" (Smith, 1945) included 50 new species with the type specimens from his fish collection sent from Siam as well as other collections deposited in the Smithsonian made by Layang Gaddi and H.G. Deignan, and at the Museum of Comparative Zoology of Harvard University by Harold J. Coolidge, Jr. The primary type specimens (="type" in Smith's papers) described in Smith (1931) and Smith (1945) were clearly stated where they were deposited; however, those of Smith (1934) have so far remained confused because of the lack of catalog numbers. This problem resulted in discrepancies between the calalog numbers of some of Smith (1934)'s types presented in Smith (1945) with USNM numbers and later replaced with KUMF numbers in Monkolprasit (1969). These replacements included the holotypes of *Labeo munensis* (USNM 3112 replaced with KUMF0162), *Chela mauclicauda* (USNM 103372 replaced with KUMF 0158) and *Rasbora borapetensis* (USNM 108127 replaced with KUMF 0163). The main objective of the present study was to rediscover these type specimens from the Smithsonian Institution.

The authors of the present paper visited the Smithsonian Institution between 11-28 May 2013 under cooperation between the National Science Museum, Thailand, the Smithsonian Institution, U.S.A. and the Hokkaido University Museum, Japan, to investigate the primary types of Thai fishes described by Smith deposited at the Smithsonian and related archival documents in the Smithsonian

Institution Archives. A total of 53 specimens assumed to be holotypes of Thai fishes belonging to 10 families were morphologically examined, and more than 150 pages of letters written by Dr. Smith and H.G. Deignan during their stay in Thailand and news-paper cuttings were found. The results of the investigation are documented here to provide further information on Smith's type specimens from Thailand.

MATERIALS AND METHODS

The present investigation examined Dr. Smith's collection from Thailand at the Museum Support Center of the Smithsonian Institution. The collection comprises 53 bottles with 54 fish specimens preserved in ethanol and clearly labeled as holotypes. Of the 54 specimens, 53 are considered to be holotypes. Based on the systematic arrangement of Nelson (2006) and the current taxonomic status of Eschmeyer *et al.* (2018), the specimens represent 49 valid species, 38 genera, 10 families, and 4 orders. The specimens are listed below showing all the information on the bottle labels, original species name and standard length (SL), and collection location (with our estimation on the locality using current names shown in parentheses), as well as relevant references and our identification of the species in brackets. In addition, some counts and measurements of the type specimens are given.

Counts and measurements were made on the left side of specimens whenever possible. Measurements were made point to point using calipers, or a set dividers and steel rules to the nearest tenth of a millimeter. The method of measurements followed Hubbs and Lagler (1958) except for the six following measurements: 1) body depth is a vertical distance at the origin of the dorsal fin, except for specimens lacking the dorsal fin or having the dorsal fin located far posteriorly in which case the measurement was taken at the origin of the anal fin; 2) head width was measured at the midpoint of the opercle; 3) interorbital width was taken from the plane passing through the center of the pupil; 4) mouth width was measured at the posterior end of the groove between the upper and lower lips at the angle of the jaws; and 5) barbel lengths were measured from base to extremity. For special adhesive apparatuses, including the sucking disc of the genus *Garra* and the thoracic adhesive apparatus of the genus *Glyptothorax*, their width was measured as the widest distance of the apparatus and their length was taken from the anterior mid-point of the anterior margin to the posteriormost margin. Subunits of the head are presented as proportions of head length (HL). Head length and measurements of the body parts are given as proportions of standard length (SL). The scale counts follow Kottelat (2001). The fin ray counts followed Nakabo (2002), except for caudal-fin rays for which branched rays, unbranched rays and rudimentary elements together were counted following the formula of Kottelat (1990). The vertebral counts were taken from x-radiographs and followed Roberts (1989). The Weberian complex of cypriniforms and siluriforms was regarded as comprising four and five vertebrae, respectively, and the urostyle was counted as the last caudal vertebra.

Order Cypriniformes

Family Cyprinidae

1. USNM 90298, 46.5 mm SL, holotype of *Barilius koratensis* Smith, 1931; Menam Mun at Ta Chang (=Mun River, Tha Chang Subdistrict, Chalermprakiat District, Nakhon Ratchasima Province); Phra Anuwati, November 1926 [Described by Smith (1931), p.16, fig.7; identified in the present study as *Opsarius koratensis* (Smith, 1931) following

Rainboth (1996b)] (Fig. 2).

Dorsal rays iii,7; anal rays iii,11; pectoral rays i,12; pelvic rays ii,7; branched caudal rays 9+8; unbranched caudal rays 9+9; lateral line scales 33 on body, with 2 on the base of the caudal fin; upper transverse scale rows 6 ½; lower transverse scale rows 3; predorsal scales 15; circumpeduncular scales 14; and vertebrae 18+17=35. Head length 25.3% SL; predorsal length 57.0% SL; prepectoral length 25.8% SL; prepelvic length 48.4% SL; preanal length 69.9% SL; body depth at dorsal origin 29.0% SL; caudal peduncle depth 12.9% SL; caudal peduncle length18.3% SL; pelvic fin length 16.1% SL; dorsal fin base length 16.1% SL; anal fin base length17.7% SL; snout length 29.8% HL; head width 46.8% HL; orbital diameter 29.8% HL; interorbital width 38.3% HL; and mouth width 25.5% HL.

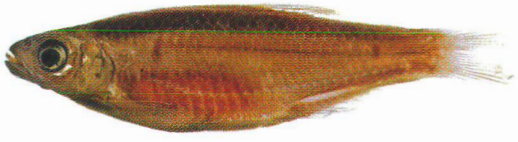


Figure 2. Holotype of *Barilius koratensis* Smith, 1931; USNM 90298; 46.5 mm SL; collection location: Mun River, Tha Chang Subdistrict, Chalermprakiat District, Nakhon Ratchasima Province; identified in the present study as *Opsarius koratensis* (Smith, 1931). Photo credit: Sandra J. Raredon, Smithsonian Institution.

2. USNM 90299, 52.7 mm SL, holotype of *Barilius pulchellus* Smith, 1931; Mekang, at Pang Chao, northern Siam (=Mae Klang Luang Village, Chom Thong District, Chiang Mai Province); 1 December 1928 [Described by Smith (1931), p. 17, fig. 8; identified in the present study as *Opsarius pulchellus* (Smith, 1931) following Kottelat (2001b)] (Fig. 3).

Dorsal rays ii,9; anal rays iii,11; pectoral rays i,13; pelvic rays i,8; branched caudal rays 9+8; unbranched caudal rays 10+9; circumpeduncular scales 12; and vertebrae 19+19=38. Head length 27.2% SL; predorsal length 62.7% SL; prepectoral length 31.0% SL; prepelvic length 52.3% SL; preanal length 67.3% SL; body depth at dorsal origin 25.1% SL; caudal peduncle depth 10.3% SL; caudal peduncle length 18.6% SL; pectoral fin length 20.2% SL; pelvic fin length 15.9% SL; dorsal fin base length 13.3% SL; anal fin base length 17.9% SL; snout length 28.7% HL; head width 44.5% HL; orbital diameter 28.7% HL; interorbital width 33.0% HL; and mouth width 19.2% HL.

Remark: The original description (Smith, 1931) recorded the total length of the holotype to be 7.0 cm. Two specimens of this species labeled as holotypes are extant in the same bottle, 49.9 mm SL and 52.7 mm SL. The larger specimen is considered likely to be the holotype, since it more closely approximates a Smith's described specimen in the body size and shape as well as position of lateral bars shown in the original figure.



Figure 3. Holotype of *Barilius pulchellus* Smith, 1931; USNM 90299; 52.7 mm SL; collection location: Mae Klang Luang Village, Chom Thong District, Chiang Mai Province; identified in the present study as *Opsarius pulchellus* (Smith, 1931). Photo credit: Sandra J. Raredon, Smithsonian Institution.

3. USNM 103372, 42.8 mm SL, holotype of *Chela maculicauda* Smith, 1934; Klong Ranode, Tale Sap, peninsular Siam (=Khlong Ranode, Canal Songkhla Province); H.M. Smith, 9 October 1923 [Described by Smith (1934), p. 301; identified in the present study as *Parachela maculicauda* (Smith, 1934) following Kottelat (1995)] (Fig. 4).

Dorsal rays ii,8; anal rays ii,25; pectoral rays i,10; pelvic rays ii,4; branched caudal rays 9+8; unbranched caudal rays 8+7; lateral line scales 36 on body, with 2 on the base of the caudal fin; and vertebrae 17+19=36. Head length 25.2% SL; predorsal length 64.9% SL; prepectoral length 29.2% SL; prepelvic length 55.0% SL; preanal length 66.1% SL; body depth at dorsal origin 29.8% SL; caudal peduncle depth 12.9% SL; caudal peduncle length 9.4% SL; pectoral fin length 39.2% SL; pelvic fin length 14.0% SL; dorsal fin base length 8.8% SL; anal fin base length 28.1% SL; snout length 27.9% HL; head width 46.5% HL; orbital diameter 37.2% HL; interorbital width 32.6% HL; and mouth width 25.6% HL.

Remark: Smith (1934) originally stated "the type, 5.5 cm. long, was taken in Klong Ranode, an affluent of Tale Sap, Peninsular Siam, October 9, 1923", but no catalog number was cited. Subsequently, Smith (1945) referred to USNM 103372 as the holotype for the species. However, Mongkolprasit (1969) replaced USNM 103372 with KUMF 0158 without clear reasonable considerations. In fact, USNM 103372 is still deposited in the Smithsonian collection, therefore KUMF 0158 designated by Mongkolprasit (1969) is invalid.

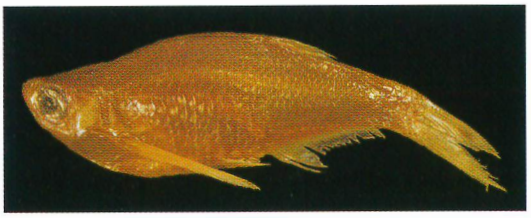


Figure 4. Holotype of *Chela maculicauda* Smith, 1934; USNM 103372, 42.8 mm SL; collection location: Khlong Ranode Canal, Songkhla Province; identified in the present study as *Parachela maculicauda* (Smith, 1934). Photo credit: Veera Vilasri, National Science Museum, Thailand.

4. USNM 107959, 43.8 mm SL, holotype of *Chela mouhoti* Smith, 1945; Pasak River at Pechabun, central Siam (=Pasak River, Mueang Petchabun District, Petchabun Province); 23 February 1934 [Described by Smith (1945), p. 80, fig. 4; identified in the present study as *Laubuka caeruleostigmata* (Smith, 1931) following Fang, *et al.* (2009)] (Fig. 5).

Dorsal rays ii,10; anal rays iii,21; pectoral rays i,12; pelvic rays ii,6; branched caudal rays 9+8; unbranched caudal rays 5+5; lateral line scales 31 on body, with 2 on the base of the caudal fin; upper transverse scale rows 7 ½; lower transverse scale rows 8; predorsal scales 17; circumpeduncular scales 15; and vertebrae 16+18=34. Head length 24.6% SL; predorsal length 71.4% SL; prepectoral length 27.4% SL; prepelvic length 52.6% SL; preanal length 74.9% SL; body depth at dorsal origin 41.1% SL; caudal peduncle depth 11.4% SL; caudal peduncle length 11.4% SL; dorsal fin base length 17.1% SL; anal fin base length 30.9% SL; snout length 32.6% HL; head width 65.1% HL; orbital diameter 32.6% HL; and mouth width 32.6% HL.

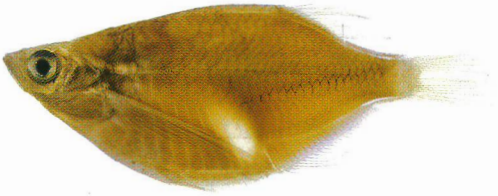


Figure 5. Holotype of *Chela mouhoti* Smith, 1945; USNM 107959; 43.8 mm SL; collection location: Pasak River, Mueang Petchabun District, Petchabun Province; identified in the present study as *Laubuka caeruleostigmata* (Smith, 1931). Photo credit: Sandra J. Raredon, Smithsonian Institution.

5. USNM 107960, 110.4 mm SL, holotype of *Cirrhinus lineatus* Smith, 1945; Lam Tong Lang, north of Pakjong, eastern Siam (=Lam Tong Lang Stream, Pak Chong District,

Nakhon Ratchasima Province); 19 July 1925 [Described by Smith (1945), p. 163, fig. 25; identified in the present study as *Henicorhynchus lineatus* (Smith, 1945) following Chu and Cui (1989)] (Fig. 6).

Dorsal rays iv,8; anal rays iv,5; pectoral rays i,14; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 11+9; lateral line scales 30 on body, with 2 on the base of the caudal fin; upper transverse scale rows 5 ½; lower transverse scale rows 5 ½; predorsal scales 11; circumpeduncular scales 20; and vertebrae 21+11=32. Head length 24.2% SL; predorsal length 48.0% SL; prepectoral length 26.1% SL; prepelvic length 53.8% SL; preanal length 78.7% SL; body depth at dorsal origin 29.1% SL; caudal peduncle depth 11.4% SL; caudal peduncle length 16.0% SL; pectoral fin length 22.3% SL; pelvic fin length 17.4% SL; dorsal fin base length 20.1% SL; anal fin base length 8.7% SL; snout length 31.3% HL; head width 59.2% HL; orbital diameter 19.1% HL; interorbital width 44.2% HL; and mouth width 24.0% HL.



Figure 6. Holotype of *Cirrhinus lineatus* Smith, 1945; USNM 107960; 110.4 mm SL; collection location: Lam Tong Lang Stream, Pak Chong District, Nakhon Ratchasima Province; identified in the present study as *Henicorhynchus lineatus* (Smith, 1945). Photo credit: Sandra J. Raredon, Smithsonian Institution.

6. USNM 107962, 33.0 mm SL, holotype of *Danio* (*Danio*) *peninsulae* Smith, 1945; mountain brook, Kao Luang, Nakon Sritamarat, peninsular Siam, 300 m (=a brook at Khao Luang Mountain, Nakhon Si Thammarat Province); 20 July 1928 [Described by Smith (1945), p. 98, fig. 7; identified in the present study as *Devario regina* (Fowler, 1934) following Kottelat (2013)] (Fig. 7).

Dorsal rays iii,11; anal rays iii,15; pectoral rays i,12; branched caudal rays 9+8; unbranched caudal rays 7+6; upper transverse scale rows 8 ½; predorsal scales 15; circumpeduncular scales 15; and vertebrae 16+19=35. Head length 27.3% SL; predorsal length 61.4% SL; prepectoral length 29.6% SL; preanal length 67.4% SL; body depth at dorsal origin 30.3% SL; caudal peduncle depth 14.4% SL; caudal peduncle length 16.7% SL; dorsal fin base length 22.0% SL; anal fin base length 24.2% SL; snout length 27.8% HL; head width 52.8% HL; oribital diameter 41.8% HL; interorbital width 44.4% HL; and mouth width 25.0% HL.



Figure 7. Holotype of *Danio* (*Danio*) *peninsulae* Smith, 1945; USNM 107962; 33.0 mm SL; collection location: a brook at Khao Luang Mountain, Nakhon Si Thammarat Province; Identified in the present study as *Devario regina* (Fowler, 1934). Photo credit: Sandra J. Raredon, Smithsonian Institution.

7. USNM 107961, 57.8 mm SL, holotype of *Daniops myersi* Smith, 1945; Huey Melao, Doi Hua Mot, northern Siam (=Huai Mae Lao Stream at Doi Mod Mountain, Wiang Pa Pao District, Chiang Rai Province); H.M. Smith, 23 August 1934 [Described by Smith (1945), p. 92, fig. 6; identified in the present study as *Devario laoensis* (Pellegrin and Fang, 1940) following Kottelat (2013)] (Fig. 8).

Dorsal rays iii,9; anal rays iii,13; pectoral rays i,10; pelvic rays i,6; branched caudal rays 9+8; unbranched caudal rays 7+7; lateral line scales 34 on body, with 1 on the base of

the caudal fin; upper transverse scale rows 6 ½; lower transverse scale rows 2; predorsal scales 16; circumpeduncular scales 12; and vertebrae 17+18=35. Head length 24.2% SL; predorsal length 56.3% SL; prepectoral length 25.5% SL; prepelvic length 45.9% SL; preanal length 67.5% SL; body depth at dorsal origin 28.1% SL; caudal peduncle depth 12.6% SL; caudal peduncle length 17.5% SL; pectoral fin length 20.4% SL; pelvic fin length14.3% SL; dorsal fin base length17.3% SL; anal fin base length 19.5% SL; snout length 30.4% HL; head width 55.4% HL; eye diameter 30.4% HL; interorbital width 48.2% HL; and mouth width 30.4% HL.



Figure 8. Holotype of *Daniops myersi* Smith, 1945; USNM 107961; 57.8 mm SL; collection location: Huai Mae Lao Stream, Doi Mod Mountain, Wiang Pa Pao District, Chiang Rai Province; identified in the present study as *Devario laoensis* (Pellegrin and Fang, 1940). Photo credit: Sandra J. Raredon, Smithsonian Institution.

8. USNM 109764, 45.5 mm SL, holotype of *Epalzeorhynchos kalliurus* Smith, 1945; Mekong at Chiengsen Kao, northern Siam (=Mekong River, Chiang Saen District, Chiang Rai Province); H.G. Deignan, 13 January 1937 [Described by Smith (1945), p. 264, fig. 51; identified in the present study as *Crossocheilus cobitis* (Bleeker, 1853) following Kottelat (2001a)] (Fig. 9).

Dorsal rays iv,8; anal rays iii,5; pectoral rays i,13; pelvic rays i,8; branched caudal rays 9+8; unbranched caudal rays 10+8; lateral line scales 33 on body, with 2 on the base of the caudal fin; upper transverse scale rows 5 ½; lower transverse scale rows 4 ½; predorsal scales 8; circumpeduncular scales 16; and vertebrae 21+12=33. Head length 24.2% of SL; predorsal length 48.4% SL; prepectoral length 25.3% SL; prepelvic length 52.2% SL; preanal length 76.9% SL; body depth at dorsal origin 24.7% SL; caudal peduncle depth 12.1% SL; caudal peduncle length 17.0% SL; pectoral fin length 22.0% SL; pelvic fin length 20.9% SL; dorsal fin base length 18.7% SL; anal fin base length 9.9% SL; snout length 40.9% HL; head width 59.1% HL; orbital diameter 29.6% HL; interorbital width 47.7% HL; and mouth width 25.0% HL.



Figure 9. Holotype of *Epalzeorhynchos kalliurus* Smith, 1945; USNM 109764; 45.5 mm SL; collection location: Mekong River, Chiang Saen District, Chiang Rai Province; identified in the present study as *Crossocheilus cobitis* (Bleeker, 1853). Photo credit: Sandra J. Raredon, Smithsonian Institution.

9. USNM 90300, 96.0 mm SL, holotype of *Garra taeniata* Smith, 1931; Tadi Stream, Nakon Sritamarat, peninsular Siam (=Thadee Stream, Nakhon Si Thammarat Province); 7 October 1928 [Described by Smith (1931), p. 19, pl. 1; identified in the present study as *Garra cambodgiensis* (Tirant, 1884) following Kottelat (1986)] (Fig. 10).

Dorsal rays iii,8; anal rays iii,5; pectoral rays i,16; pelvic rays i,8; branched caudal rays 8+8; unbranched caudal rays 10+8; lateral line scales 31 on body, with 2 on the base of the caudal fin; upper transverse scale row 4 ½; lower transverse scale row 3 ½; predorsal scales 10; circumpeduncular scales 12; and vertebrae 21+11=32. Head length 22.1% SL; predorsal length 43.1% SL; prepectoral length 20.7% SL; prepelvic

length 50.2% SL; preanal length 78.3% SL; body depth at dorsal origin 20.8% SL; caudal peduncle depth 11.3% SL; caudal peduncle length 16.9% SL; pectoral fin length 22.8% SL; pelvic fin length 21.2% SL; dorsal fin base length 18.1% SL; anal fin base length 8.9% SL; snout length 49.5% HL; head width 65.0% HL; orbital diameter 20.5% HL; interorbital width 38.3% HL; mouth width 37.4% HL; mental disc length 23.4% HL; and mental disc width 41.7% HL.



Figure 10. Holotype of *Garra taeniata* Smith, 1931; USNM 90300; 96.0 mm SL; collection location; Thadee Stream, Nakhon Si Thammarat Province; identified in the present study as *Garra cambodgiensis* (Tirant, 1884). Photo credit: Sandra J. Raredon, Smithsonian Institution.

10. USNM 103366, 131.5 mm SL, holotype of *Hampala dispar* Smith, 1934; Menam Mun, Ubol, eastern Siam (=Mun River, Ubon Ratchatani Province); H.M. Smith, 25 March 1929 [Described by Smith (1934), p. 309, pl. 11; valid as *Hampala dispar* Smith, 1934] (Fig. 11).

Dorsal rays iv,8; anal rays iii,5; pectoral rays i,14; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 10+9; lateral line scales 25 on body, with 3 on the base of the caudal fin; upper transverse scale rows 4 ½; lower transverse scale rows 4; predorsal scales 10; circumpeduncular scales 12; and vertebrae 18+12=30. Head length 32.9% SL; predorsal length 51.6% SL; prepectoral length 31.0% SL; prepelvic length 53.0% SL; preanal length 77.7% SL; body depth at dorsal origin 31.7% SL; caudal peduncle depth 13.0% SL; caudal peduncle length 19.4% SL; pectoral fin length 18.7% SL; pelvic fin length 16.6% SL; dorsal fin base length 17.5% SL; anal fin base length 7.9% SL; snout length 28.4% HL; head width 48.1% HL; orbital diameter 18.5% HL; interorbital width 28.9% HL; and mouth width 33.6% HL.

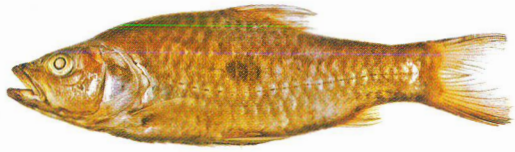


Figure 11. Holotype of *Hampala dispar* Smith, 1934; USNM 103366; 131.5 mm SL; collection location: Mun River, Ubon Ratchatani Province; identified in the present study as *Hampala dispar* Smith, 1934. Photo credit: Sandra J. Raredon, Smithsonian Institution.

11. USNM 119490, 97.3 mm SL, holotype of *Henicorhynchus lobatus* Smith, 1945; Mekok at Chiengrai, northern Siam (=Kok River, Chiang Rai Province); H.M. Smith, 2 March 1924 [Described by Smith (1945), p. 257, fig. 49; valid as *Henicorhynchus lobatus* Smith, 1945] (Fig. 12).

Dorsal rays iv,8; anal rays iii,5; pectoral rays i,14; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 9+8; lateral line scales 33 on body, with 2 on the base of the caudal fin; upper transverse scale rows 5½; lower transverse scale rows 5; predorsal scales 10; circumpeduncular scales 20; and vertebrae 21+12=33. Head length 24.7% SL; predorsal length 45.1% SL; prepectoral length 24.3% SL; prepelvic length 54.5% SL; preanal length 78.9% SL; body depth at dorsal origin 28.4% SL; caudal peduncle depth 11.7% SL; length of caudal peduncle 17.3% SL; pectoral fin length 22.2% SL; pelvic fin length 18.3% SL; dorsal fin base length 17.4% SL; anal fin base length 7.9% SL; snout length 37.3% HL; head width 54.3% HL; orbital diameter 25.0% HL; interorbital width 43.1% HL; and mouth width 27.6% HL.

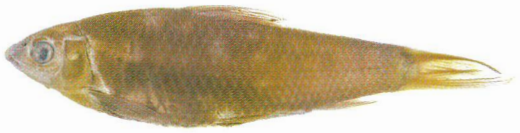


Figure 12. Holotype of *Henicorhynchus lobatus* Smith, 1945; USNM 119490; 97.3 mm SL; collection location: Kok River, Chiang Rai Province; identified in the present study as *Henicorhynchus lobatus* Smith, 1945. Photo credit: Sandra J. Raredon, Smithsonian Institution.

12. USNM 90291, 76.7 mm SL, holotype of *Labeo bicolor* Smith, 1931; Paknampo, fish chute (=a chute at Paknampo Subdistrict, Mueang Nakhon Sawan District, Nakhon Sawan Province); 19 November 1923 [Described by Smith (1931), p. 9, fig. 4; identified in the present study as *Epalzeorhynchos bicolor* (Smith, 1931) following Doi (1997)] (Fig.13).

Dorsal rays iv,13; anal rays iii,5; pectoral rays i,16; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 10+8; lateral line scales 32 on body, with 2 on the base of the caudal fin; upper transverse scale rows 6 ½; lower transverse scale rows 5 ½; predorsal scales 11; circumpeduncular scales 16; and vertebrae 21+11=32. Head length 27.0% SL; predorsal length 47.0% SL; prepectoral length 25.5% SL; prepelvic length 51.9% SL; preanal length 76.0% SL; body depth at dorsal origin 29.8% SL; caudal peduncle depth 12.6% SL; caudal peduncle length 15.1% SL; pectoral fin length 23.5% SL; pelvic fin length 24.3% SL; dorsal fin base length 29.4% SL; anal fin base length 12.7% SL; snout length 38.5% HL; head width 55.4% HL; orbital diameter 23.4% HL; interorbital width 37.0% HL; and mouth width 33.2% HL.



Figure 13. Holotype of *Labeo bicolor* Smith, 1931; USNM 90291; 76.7 mm SL; collection location: a chute at Paknampo Subdistrict, Mueang Nakhon Sawan District, Nakhon Sawan Province; identified in the present study as *Epalzeorhynchos bicolor* (Smith, 1931). Photo credit: Sandra J. Raredon, Smithsonian Institution.

13. USNM 107964, 92.4 mm SL, holotype of *Labeo indramontri* Smith, 1945; Bung Borapet, central Siam (= Bueng Borapet Swamp, Nakhon Sawan Province); 24 November 1923 [Described by Smith (1945), p. 251, fig. 46; valid as *Labeo indramontri* Smith, 1945] (Fig. 14).

Dorsal rays v,11; anal rays iii,5; pectoral rays i,16; pelvic rays i,8; branched caudal rays 9+8; unbranched caudal rays 11+9; lateral line scales 38 on body, with 2 on the base of the caudal fin; upper transverse scale rows 8 ½; lower transverse scale rows 6 ½; predorsal scales 15; circumpeduncular scales 22; and vertebrae 25+13=38. Head length 27.1% SL; predorsal length 44.6% SL; prepectoral length 26.8% SL; prepelvic length 54.2% SL; preanal length 77.5% SL; body depth at dorsal origin 27.3% SL; caudal peduncle depth 12.4% SL; caudal peduncle length 17.1% SL; pectoral fin length 19.1% SL; pelvic fin length 19.3% SL; dorsal fin base length 22.9% SL; anal fin base length 8.7% SL; snout length 42.8% HL; head width 56.3% HL; orbital diameter 20.6% HL; interorbital width 43.0% HL; and mouth width 19.1% HL.



Figure 14. Holotype of *Labeo indramontri* Smith, 1945; USNM 107964; 92.4 mm SL; collection location: Bueng Borapet Swamp, Nakhon Sawan Province; identified in the present study as *Labeo indramontri* Smith,

1945. Photo credit: Sandra J. Raredon, Smithsonian Institution.

14. USNM 90287, 40.3 mm SL, holotype of *Laubuca caeruleostigmata* Smith, 1931; Paknampo, fish chute (=a chute at Paknampo Subdistrict, Mueang Nakhon Sawan District, Nakhon Sawan Province); 20 November 1923 (?) [Described by Smith (1931), p. 5, fig. 3; identified in the present study as *Laubuka caeruleostigmata* Smith, 1931 following Fang, *et al.* (2009)] (Fig.15).

Dorsal rays ii,11; anal rays iii,20; pectoral rays i,9; ventral rays ii,6; branched caudal rays 9+8; unbranched caudal rays 5+5; and vertebrae 16+17=33. Head length 24.8% SL; predorsal length 67.7% SL; prepectoral length 30.4% SL; prepelvic length 28.6% SL; preanal length 73.9% SL; body depth at dorsal origin 41.6% SL; caudal peduncle depth 12.4% SL; caudal peduncle length 11.2% SL; pectoral fin length 44.7% SL; pelvic fin length 26.1% SL; dorsal fin base length 17.4% SL; anal fin base length 31.1% SL; snout length 35.0% HL; head width 65.0% HL; orbital diameter 32.5% HL; interorbital width 57.5% HL; and mouth width 30.0% HL.

Remarks: The original description (Smith, 1931) cited the locality of USNM 90287 as the Menam Chao Phya below Nakon Sawan, Central Siam, January 5, 1925, but the specimen label was noted as Paknampo, fish chute, 20 November 1923. The published information for this specimen is regarded as erroneous.

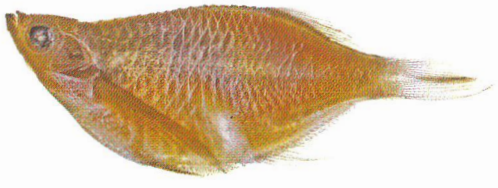


Figure 15. Holotype of *Laubuca caeruleostigmata* Smith, 1931 (?); USNM 90287; 40.3 mm SL; collection location: chute at Paknampo Subdistrict, Mueang Nakhon Sawan District, Nakhon Sawan Province; identified in the present study as *Laubuka caeruleostigmata* Smith, 1931. Photo credit: Sandra J. Raredon, Smithsonian Institution.

15. USNM 107947, 92.1 mm SL, holotype of *Lobocheilus cheveyi* Smith, 1945; Menam Mao, brook of Menam Fang, northern Siam (=Huai Mae Mao Brook, Fang River, Chiang Rai Province); H.G. Deignan, 25 December 1936 [Described by Smith (1945), p. 245, fig. 45; identified in the present study as *Lobocheilos rhabdoura* (Fowler, 1934) following Kottelat (2001a)] (Fig.16).

Dorsal rays iv,8; anal rays iv,5; pectoral rays i,15; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 8+9; lateral line scales 32 on body, with 2 on the base of the caudal fin; upper transverse scale rows 5 ½; lower transverse scale rows 4 ½; predorsal scales 11; circumpeduncular scales 16; and vertebrae 20+12=32. Head length 24.3% SL; predorsal length 45.2% SL; prepectoral length 26.0% SL; prepelvic length 53.7% SL; preanal length 74.5% SL; body depth at dorsal origin 23.5% SL; caudal peduncle depth 11.1% SL; caudal peduncle length 21.4% SL; pectoral fin length 21.5% SL; pelvic fin length 20.5% SL; dorsal fin base length 16.9% SL; anal fin base length 9.0% SL; snout length 42.0% HL; head width 56.5% HL; orbital diameter 17.5% HL; interorbital width 43.3% HL; and mouth width 31.8% HL.



Figure 16. Holotype of *Lobocheilus cheveyi* Smith, 1945; USNM 107947; 92.1 mm SL; collection location: Huai Mae Mao Brook, Fang River, Chiang Rai Province; identified in the present study as *Lobocheilos rhabdoura* (Fowler, 1934). Photo credit: Sandra J. Raredon, Smithsonian Institution.

16. USNM 107957, 130.0 mm SL, holotype of *Lobocheilus cornutus* Smith, 1945; Klong Chawang, mountain stream east of Bandon, peninsular Siam (=Khlong Chawang Stream, Khao Luang Mountain, Nasan District, Surat Thani Province); R. Havmöller, February 1929 [Described by Smith (1945), p. 242, fig. 44; identified in the present study as *Lobocheilos rhabdoura* (Fowler, 1934) following Ciccotto and Page (2016)] (Fig.17).

Dorsal rays iv,8; anal rays iii,5; pectoral rays i,15; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 9+8; lateral line scales 33 on body, with 2 on the base of the caudal fin; upper transverse scale rows 5 ½; lower transverse scale rows 4 ½ ; predorsal scales 11; circumpeduncular scales 16; and vertebrae 20+12=32. Head length 24.6% SL; predorsal length 43.8% SL; prepectoral length 24.7% SL; prepelvic length 50.4% SL; preanal length 74.0% SL; body depth at dorsal origin 26.2% SL; caudal peduncle depth 11.2% SL; caudal peduncle length19.6% SL; pectoral fin length19.3% SL; pelvic fin length 17.8% SL; dorsal fin base length 16.5% SL; anal fin base length 8.4% SL; snout length 47.5% HL; head width 54.0% HL; orbital diameter 17.2% HL; interorbital width 43.3% HL; and mouth width 37.6% HL.



Figure 17. Holotype of *Lobocheilus cornutus* Smith, 1945; USNM 107957; 130.0 mm SL; collection location: Khlong Chawang Stream, Khao Luang Mountain, Nasan District, Surat Thani Province; identified in the present study as *Lobocheilos rhabdoura* (Fowler, 1934). Photo credit: Sandra J. Raredon, Smithsonian Institution.

17. USNM 109772, 127.5 mm SL, holotype of *Lobocheilus nigrovittatus* Smith, 1945; Lam Tong Lang, central Siam (=Lam Tong Lang Stream, Pak Chong District, Nakhon Ratchasima Province); Layang Gaddi, 19 July 1925 [Described by Smith (1945), p. 240, fig. 43; identified in the present study as *Lobocheilos rhabdoura* (Fowler, 1934) following Ciccotto and Page (2016)] (Fig.18).

Dorsal rays iv,8; anal rays iii,5; pectoral rays i,14; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 9+8; lateral line scales 31 on body, with 2 on the base of the caudal fin; upper transverse scale rows 5 ½; lower transverse scale rows 4 ½; predorsal scales 10; circumpeduncular scales 16; and vertebrae 20+12=32. Head length 22.9% SL; predorsal length 44.6% SL; prepectoral length 24.2% SL; prepelvic length 51.4% SL; preanal length 74.6% SL; body depth at dorsal origin 23.6% SL; caudal peduncle depth 10.6% SL; caudal peduncle length 18.1% SL; pectoral fin length 21.0% SL; pelvic fin length 19.4% SL; dorsal fin base length 16.8% SL; anal fin base length 7.9% SL; head width 56.8% HL; orbital diameter 16.9% HL; interorbital width 46.1% HL; and mouth width 27.5% HL.



Figure 18. Holotype of *Lobocheilus nigrovittatus* Smith, 1945; USNM 109772; 127.5 mm SL; collection location: Lam Tong Lang Stream, Pak Chong District, Nakhon Ratchasima Province; identified in the present study as *Lobocheilos rhabdoura* (Fowler, 1934). Photo credit: Sandra J. Raredon, Smithsonian Institution.

18. USNM 119497, 41.3 mm SL, holotype of *Puntius faucis* Smith, 1945; gorge of the Mechem, trib. of Meping, northern Siam (=a gorge of Huai Mae Chaem Stream, Chiang Mai Province); Buchanan and Harrisson, July 1935 [Described by Smith (1945), p.

180, fig. 30; identified in the present study as *Poropuntius faucis* (Smith, 1945) following Doi (1997)] (Fig. 19).

Dorsal rays iv,8; anal rays iii,5; pectoral rays i,14; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 10+9; lateral line scales 30 on body, with 1 on the base of the caudal fin; upper transverse scale rows 5 ½; lower transverse scale rows 3; predorsal scales 12; circumpeduncular scales 14; and vertebrae 25+15=40. Head length 28.5% SL; predorsal length 53.3% SL; prepectoral length 30.3% SL; prepelvic length 53.3% SL; preanal length 75.8% SL; body depth at dorsal origin 30.3% SL; caudal peduncle depth 12.1% SL; caudal peduncle length 17.0% SL; pectoral fin length 21.8% SL; pelvic fin length 19.4% SL; dorsal fin base length 15.8% SL; anal fin base length 9.1% SL; snout length 34.0% HL; head width 46.8% HL; orbital diameter 38.3% HL; interorbital width 31.9% HL; and mouth width 29.8% HL.

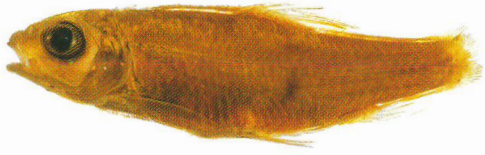


Figure 19. Holotype of *Puntius faucis* Smith, 1945; USNM 119497; 41.3 mm SL; collection location: a gorge in Huai Mae Chaem Stream, Chiang Mai Province; identified in the present study as *Poropuntius faucis* (Smith, 1945). Photo credit: Sandra J. Raredon, Smithsonian Institution.

19. USNM 119713, 41.0 mm SL, holotype of *Puntius paucisquamatus* Smith, 1945; mountain brook on Kao Luang, 1,000 feet, Nakon Sritamarat, peninsular Siam (=a brook at Khao Luang Mountain, Nakhon Si Thammarat Province); H.M. Smith, 20 July 1928 [Described by Smith (1945), p. 178, fig. 29; identified in the present study as *Neolissochilus paucisquamatus* (Smith, 1945) following Rainboth (1985)] (Fig. 20).

Dorsal rays v,9; anal rays iv,5; pectoral rays i,15; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 9+8; lateral line 21, with 1 on the base of the caudal fin; upper transverse scale rows 3 ½; lower transverse scale rows 4; predorsal scales 7; circumpeduncular scales 12; and vertebrae 24+15=39. Head length 28.7% SL; predorsal length 48.8% SL; prepectoral length 27.4% SL; prepelvic length 55.5% SL; preanal length 76.8% SL; body depth at dorsal origin 30.5% SL; caudal peduncle depth 14.6% SL; caudal peduncle length 19.5% SL; pectoral fin length 22.6% SL; pelvic fin length20.7% SL; dorsal fin base length 17.1% SL; anal fin base length 8.5% SL; snout length 29.8% HL; head width 55.3% HL; orbital diameter 34.0% HL; interorbital width 34.0% HL; and mouth width 23.4% HL.

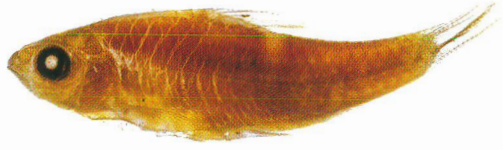


Figure 20. Holotype of *Puntius paucisquamatus* Smith, 1945; USNM 119713; 41.0 mm SL; collection location: a brook at Khao Luang Mountain, Nakhon Si Thammarat Province; identified in the present study as *Neolissochilus paucisquamatus* (Smith, 1945). Photo credit: Sandra J. Raredon, Smithsonian Institution.

20. USNM 117755, 24.3 mm SL, holotype of *Puntius sametensis* Smith, 1945; Nong Samet, southeastern Siam (In the original description, Nong Samet was cited as "a marsh or pond near Chanthaburi". This locality is unclear because there are several places named Nong Samet in Chantaburi Province); H.M. Smith, 19 July 1928 [described by Smith (1945), p. 176, fig. 28; identified in the present study as *Barbodes aurotaeniatus* (Tirant, 1885) following Kottelat (2013)]

(Fig. 21).

Dorsal rays iv,9; anal rays iii,5; pectoral rays i,14; pelvicrays ii,8; branched caudal rays 9+8; unbranched caudal rays 9+8; lateral line scales 21 with 2 on the base of the caudal fin; upper transverse scale rows 4 ½; lower transverse scale rows 3; predorsal scales 9; circumpeduncular scales 12; and vertebrae 17+13=30. Head length 29.9% SL; predorsal length 55.7% SL; prepectoral length 30.9% SL; prepelvic length 52.6% SL; preanal length 77.3% SL; body depth at dorsal origin 36.1% SL; caudal peduncle depth 17.5% SL; caudal peduncle length 20.6% SL; dorsal fin base length 16.5% SL; anal fin base length 11.3% SL; snout length 27.6% HL; head width 55.2% HL; orbital diameter 37.9% HL; interorbital width 41.4% HL; and mouth width 24.6% HL.



Figure 21. Holotype of *Puntius sametensis* Smith, 1945; USNM 117755; 24.3 mm SL; collection location: an unclear place named Nong Samet, Chanthaburi Province; identified in the present study as *Barbodes aurotaeniatus* (Tirant, 1885). Photo credit: Sandra J. Raredon, Smithsonian Institution.

21. USNM 119452, 43.0 mm SL, holotype of *Puntius simus* Smith, 1945; Huey Melin, brook of Menam Mao, northern Siam (=Huai Mae Lin Brook, Mae Mao Stream, Fang District, Chiang Mai Province); H.G. Deignan, 25 December 1936 [Described by Smith (1945), p. 185, fig. 32; identified in the present study as *Barbodes jacobusboehlkei* (Fowler, 1958) following Kottelat (2013)] (Fig.22).

Dorsal rays iv,8; anal rays iii,5; pectoral rays i,13; pelvic rays ii,9; branched caudal rays 9+8; unbranched caudal rays 10+9; lateral line scales 29 with 1 on the base of the caudal fin; upper transverse scale rows 4 ½; lower transverse scale rows 5; predorsal scales 9; circumpeduncular scales 16; and vertebrae 22+13=35. Head length 30.2% SL; predorsal length 54.1% SL; prepectoral length 30.8% SL; prepelvic length 55.8% SL; preanal length 76.7% SL; body depth at dorsal origin 35.5% SL; caudal peduncle depth 15.1% SL; caudal peduncle length 17.4% SL; pectoral fin length 22.7% SL; pelvic fin length 21.5% SL; dorsal fin base length 16.3% SL; anal fin base length 9.3% SL; snout length 26.9% HL; head width 61.5% HL; orbital diameter 30.8% HL; interorbital width 46.2% HL; and mouth width 28.9% HL.



Figure 22. Holotype of *Puntius simus* Smith, 1945; USNM 119452; 43.0 mm SL; collection location: Huai Mae Lin Brook, Mae Mao Stream, Fang District, Chiang Mai Province; identified in the present study as *Barbodes jacobusboehlkei* (Fowler, 1958). Photo credit: Sandra J. Raredon, Smithsonian Institution.

22. USNM 90295, 93.3 mm SL, holotype of *Puntius wetmorei* Smith, 1931; Menam Chao Phya at Chainad, central Siam (=Chao Phraya River, Mueang Chai Nat District, Chai Nat Province); 5 January 1925 [Described by Smith (1931), p. 12; identified in the present study as *Hypsibarbus wetmorei* (Smith, 1931) following Rainboth (1996a)] (Fig. 23).

Dorsal rays iv,8; anal rays iii,5; pectoral rays i,14; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 8+8; lateral line scales 24 with 2 on the base of the caudal fin; upper transverse scale rows 4 ½; lower transverse scale rows 5; predorsal scales 8; circumpeduncular scales 14; and vertebrae

21+14=35. Head length 26.3% SL; predorsal length 49.5% SL; prepectoral length 26.0% SL; prepelvic length 54.4% SL; preanal length 79.9% SL; body depth at dorsal origin 39.3% SL; caudal peduncle depth 13.4% SL; caudal peduncle length 16.3% SL; pectoral fin length 27.2% SL; pelvic fin length 27.5% SL; dorsal fin base length 18.4% SL; anal fin base length 12.5% SL; snout length 29.7% HL; head width 55.3% HL; orbital diameter 29.1% HL; interorbital width 39.1% HL; and mouth width 24.5% HL.

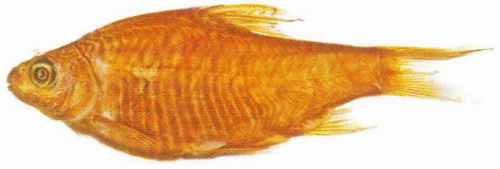


Figure 23. Holotype of *Puntius wetmorei* Smith, 1931; USNM 90295; 93.3 mm SL; collection location: Chao Phraya River, Mueang Chai Nat District, Chai Nat Province; identified in the present study as *Hypsibarbus wetmorei* (Smith, 1931). Photo credit: Sandra J. Raredon, Smithsonian Institution.

23. USNM 107956, 41.3 mm SL, holotype of *Rasbora palustris* Smith, 1945; Bung Borapet, central Siam (=Bueng Borapet Swamp, Nakhon Sawan Province); H.M. Smith; 4 December 1932 [Described by Smith (1945), p. 108, fig. 10; identified in the present study as *Rasbora daniconius* (Hamilton, 1822) following Kottelat (2001a)] (Fig.24).

Dorsal rays iii,7; anal rays iii,5; pectoral rays i,12; pelvic rays ii,7; branched caudal rays 9+8; unbranched caudal rays 10+9; lateral line scales 30 with 2 on the base of the caudal fin; upper transverse scale rows 4 ½; lower transverse scale rows 2; predorsal scales 13; circumpeduncular scales 14; and vertebrae 18+13=31. Head length 27.9% SL; predorsal length 56.4% SL; prepectoral length 29.1% SL; prepelvic length 53.3% SL; preanal length 75.8% SL; body depth at dorsal origin 26.1% SL; caudal peduncle depth 13.9% SL; caudal peduncle length 18.8% SL; pectoral fin length 21.8% SL; dorsal fin base length 14.6% SL; anal fin base length 9.7% SL; snout length 32.6% HL; head width 56.5% HL; orbital diameter 28.3% HL; interorbital width 39.1% HL; and mouth width 37.0% HL.



Figure 24. Holotype of *Rasbora palustris* Smith, 1945; USNM 107956; 41.3 mm SL; collection location: Bueng Borapet Swamp, Nakhon Sawan Province; identified in the present study as *Rasbora daniconius* (Hamilton, 1822). Photo credit: Sandra J. Raredon, Smithsonian Institution.

24. USNM 119520, 112.0 mm SL, holotype of *Rasbora retrodorsalis* Smith, 1945; Siam, Bangkok, from pond connected with Menam Chao Phya (=a pond connected to the Chao Phraya River in Bangkok); H.M. Smith, 18 March 1927 [Described by Smith (1945), p. 110, fig. 12; identified in the present study as *Rasbora aurotaenia* Tirants, 1885 following Kottelat (1986)] (Fig. 25).

Dorsal rays ii,7; anal rays iii,5; pectoral rays i,15; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 8+7; lateral line scales 32 with 2 on the base of the caudal fin; upper transverse scale rows 5 ½; lower transverse scale rows 3 ½; predorsal scales 14; circumpeduncular scales 19; and vertebrae 19+15=34. Head length 23.2% SL; predorsal length 57.6% SL; prepectoral length 23.9% SL; prepelvic length 50.6% SL; preanal length 76.2% SL; body depth at dorsal origin 28.1% SL; caudal peduncle depth 13.7% SL; caudal peduncle length 18.7% SL; pelvic fin length 17.4% SL; dorsal fin base length 10.7% SL; anal fin base length 9.9% SL; snout length 32.6% HL; head width 55.3% HL; orbital

diameter 26.4% HL; interorbital width 41.9% HL; and mouth width 23.3% HL.

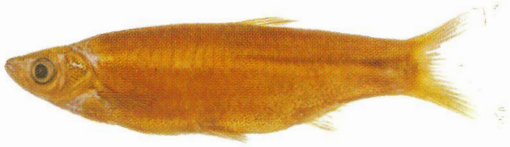


Figure 25. Holotype of *Rasbora retrodorsalis* Smith, 1945; USNM 119520; 112.0 mm SL; collection location: a pond connected to the Chao Phraya River in Bangkok; identified in the present study as *Rasbora aurotaenia* Tirants, 1885. Photo credit: Sandra J. Raredon, Smithsonian Institution.

25. USNM 90303, 173.9 mm SL, holotype of *Scaphognathus stejnegeri* Smith, 1931; Mekong River, near Ban Mekong, northeastern Siam (This locality is unknown); 24 February 1929 [Described by Smith (1931), p. 22, figs. 10-11; identified in the present study as *Scaphognathops stejnegeri* (Smith, 1931) following Rainboth (1996b)] (Fig. 26).

Dorsal rays iv,14; anal rays iii,6; pectoral rays i,15; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 8+8; lateral line scales 28 with 2 on the base of the caudal fin; upper transverse scale rows 6 ½; lower transverse scale rows 5 ½; predorsal scales 10; circumpeduncular scales 17; and vertebrae 20+16=36. Head length 23.5% SL; predorsal length 59.2% SL; prepectoral length 25.5% SL; prepelvic length 52.5% SL; preanal length 76.3% SL; body depth at dorsal origin 51.7% SL; caudal peduncle depth 14.6% SL; caudal peduncle length 16.8% SL; pectoral fin length 20.7% SL; pelvic fin length 21.1% SL; dorsal fin base length 35.4% SL; anal fin base length 16.9% SL; head width 56.4% HL; orbital diameter 27.0% HL; interorbital width 44.3% HL; and mouth width 16.0% HL.

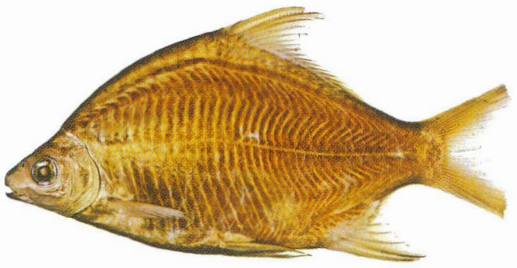


Figure 26. Holotype of *Scaphognathus stejnegeri* Smith, 1931; USNM 90303; 173.9 mm SL; collection location: Mekong River (exact location unknown); identified in the present study as *Scaphognathops stejnegeri* (Smith, 1931). Photo credit: Sandra J. Raredon, Smithsonian Institution.

26. USNM 103367, 108.1 mm SL, holotype of *Xenocheilichthys gudgeri* Smith, 1934; Nan River, northern Siam (=Nan River); Layang Gaddi, 20 April 1930 [Described by Smith (1934), p. 305, figs. a-b; identified in the present study as *Sikukia gudgeri* (Smith, 1934) following Chu and Cui (1989)] (Fig. 27).

Dorsal rays iv,8; anal rays iii,5; pectoral rays i,14; pelvic rays ii,8; branched caudal rays 9+8; unbranched caudal rays 10+9; and vertebrae 19+14=33. Head length 24.1% SL; predorsal length 55.6% SL; prepectoral length 24.7% SL; prepelvic length 47.2% SL; preanal length 72.9% SL; body depth at dorsal origin 41.9% SL; caudal peduncle depth 13.4% SL; caudal peduncle length 19.0% SL; pelvic fin length 21.7% SL; dorsal fin base length 19.3% SL; anal fin base length 13.6% SL; snout length 27.6% HL; head width 62.0% HL; orbital diameter 33.3% HL; interorbital width 42.7% HL; and mouth width 25.7% HL.



Figure 27. Holotype of *Xenocheilichthys gudgeri* Smith, 1934; USNM 103367; 108.1 mm SL; collection location: Nan River; identified in the present study as *Sikukia gudgeri* (Smith, 1934). Photo credit: Sandra J. Raredon, Smithsonian Institution.

Family Botiidae

27. USNM 90286, 29.8 mm SL, holotype of *Botia horae* Smith, 1931; water fall or west branch of Meklong, western Siam (=Khwae Noi River, Kanchanaburi Province); 24 September 1929 [Described by Smith (1931), p. 4, fig. 2; identified in the present study as *Yasuhikotakia morleti* (Tirant, 1885) following Kottelat (2004)] (Fig. 28).

Dorsal rays v,8; anal rays iii,5; pectoral rays i,12; pelvic rays i,7; branched caudal rays 9+8; unbranched caudal rays 14+12; and vertebrae 17+12=29. Head length 32.8% SL; predorsal length 57.1% SL; prepectoral length 35.3% SL; prepelvic length 59.7% SL; preanal length 78.2% SL; body depth at dorsal origin 27.7% SL; caudal peduncle depth 19.3% SL; caudal peduncle length 17.7% SL; pectoral fin length 20.2% SL; pelvic fin length 17.7% SL; dorsal fin base length 18.5% SL; anal fin base length 10.9% SL; snout length 48.7% HL; head width 43.6% HL; orbital diameter 25.6% HL; interorbital width 33.3% HL; and mouth width 18.0% HL.



Figure 28. Holotype of *Botia horae* Smith, 1931; USNM 90286; 29.8 mm SL; collection location: Khwae Noi River, Kanchanaburi Province; identified in the present study as *Yosuhikotakia morleti* (Tirant, 1885). Photo credit: Sandra J. Raredon, Smithsonian Institution.

Family Balitoridae

28. USNM 107963, 76.6 mm SL, holotype of *Balitoropsis bartschi* Smith, 1945; water fall stream, Kao Chong, near Trang, peninsular Siam (=Khao Chong Mountain, Trang Province); H.M. Smith, 2 September 1933 [Described by Smith (1945), p. 279, fig. 56; identified in the present study as *Balitoropsis zollingeri* (Bleeker, 1853) following Kottelat (2012)] (Fig. 29).

Dorsal rays ii,8; anal rays iii,5; pectoral rays i,14; pelvic rays i,9; branched caudal rays 9+8; unbranched caudal rays 7+5; lateral line 44 with 1 on the base of the caudal fin; upper transverse scale rows 6 ½; lower transverse scale rows 6; predorsal scales 14; circumpeduncular scales 17; and vertebrae 21+11=32. Head length 20.5% SL; predorsal length 49.5% SL; prepectoral length 19.3% SL; prepelvic length 49.8% SL; preanal length 79.3% SL; body depth at dorsal origin 20.4% SL; caudal peduncle depth 9.4% SL; caudal peduncle length 16.4% SL; pectoral fin length 23.1% SL; pelvic fin length 19.8% SL; dorsal fin base length 14.9% SL; anal fin base length 6.9% SL; snout length 51.9% HL; head width 90.6% HL; orbital diameter 21.2% HL; interorbital width 34.9% HL; and mouth width 25.5% HL.



Figure 29. Holotype of *Balitoropsis batschi* Smith, 1945; USNM 107963; 76.6 mm SL; collection location: Khao Chong Mountain, Trang Province; identified in the present study as *Balitoropsis zollingeri* (Bleeker, 1853). Photo credit: Sandra J. Raredon, Smithsonian Institution.

29. USNM 119488, 21.0 mm SL, holotype of *Homaloptera lineata* Smith, 1945; Mekong at Chiengsen Kao, northern Siam (=Mekong

River, Chiang Saen District, Chiang Rai Province); H.G. Deignan, 12 January 1937 [Described by Smith (1945), p. 277, fig. 55; identified in the present study as *Homalopteroides lineata* (Smith, 1945)] (Fig. 30).

Dorsal rays ii,8; anal rays ii,6; branched caudal rays 9+8; unbranched caudal rays 7+6; lateral line scales 39 with 1 on the base of the caudal fin; upper transverse scale rows 7 ½ ; lower transverse scale rows 5 ½; predorsal scales 20; circumpeduncular scales 16; and vertebrae 20+12=32. Head length 28.6% SL; predorsal length 53.6% SL; prepectoral length 22.6% SL; prepelvic length 46.4% SL; preanal length 77.4% SL; body depth at dorsal origin 16.7% SL; caudal peduncle depth 9.5% SL; caudal peduncle length 15.5% SL; dorsal fin base length 13.1% SL; anal fin base length 8.3% SL; snout length 41.7% HL; head width 62.5% HL; orbital diameter 33.3% HL; interorbital width 33.3% HL; and mouth width 25.0% HL.



Figure 30. Holotype of *Homaloptera lineata* Smith, 1945; USNM 119488; 21.0 mm SL; collection location: Mekong River, Chiang Saen District, Chiang Rai Province; identified in the present study as *Homalopteroides lineata* (Smith, 1945). Photo credit: Sandra J. Raredon, Smithsonian Institution.

Family Nemacheilidae

30. USNM 117750, 53.0 mm SL, holotype of *Noemacheilus atriceps* Smith, 1945; Menam Kon, trib. of Menam Nan, northern Siam (=Nam Kon River, Nan Province); H.G. Deignan; 21 April 1936 [Described by Smith (1945), p. 312, fig. 66; identified in the present study as *Sectoria atriceps* (Smith,1945) following Kottelat (1990)] (Fig. 31).

Dorsal rays iv,9; anal rays iii,5; pectoral rays i,10; pelvic rays i,6; branched caudal rays 9+8; unbranched caudal rays 11+7; and vertebrae 22+13=35. Head length 20.8% SL; predorsal length 50.9% SL; prepectoral length 18.9% SL; prepelvic length 51.9% SL; preanal length 77.8% SL; body depth at dorsal origin 18.4% SL; caudal peduncle depth 15.1% SL; caudal peduncle length 16.5% SL; pectoral fin length 18.4% SL; pelvic fin length 17.5% SL; dorsal fin base length 21.2% SL; anal fin base length 9.0% SL; snout length 43.2% HL; head width 77.3% HL; orbital diameter 22.7% HL; interorbital width 36.4% HL; and mouth width 40.9% HL.

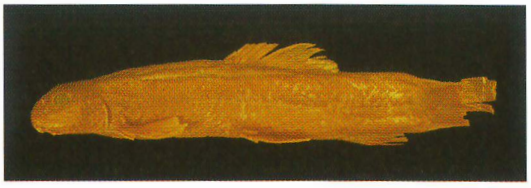


Figure 31. Holotype of *Noemacheilus atriceps* Smith, 1945; USNM 117750; 53.0 mm SL; collection location: Nam Kon River, Nan Province; identified in the present study as *Sectoria atriceps* (Smith, 1945). Photo credit: Veera Vilasri, National Science Museum, Thailand.

31. USNM 117751, 56.9 mm SL, holotype of *Noemacheilus breviceps* Smith, 1945; Menam Mao, trib. of Menam Fang, northern of Siam (=Mae Mao River, Fang District, Chiang Mai Province); H.G. Deignan; 26 December 1936 [Described by Smith (1945), p. 308, fig. 63; identified in the present study as *Schistura breviceps* (Smith, 1945) following Kottelat (1990)] (Fig. 32).

Dorsal rays iv,8; anal rays iii,5; pectoral rays i,9; pelvic rays i,7; branched caudal rays 9+8; unbranched caudal rays 12+7; and vertebrae 22+14=36. Head length 25.0% SL; predorsal length 54.5% SL; prepectoral length 25.5% SL; prepelvic length 57.1% SL; preanal

length 79.1% SL; body depth at dorsal origin 18.0% SL; caudal peduncle depth 13.6% SL; caudal peduncle length 14.9% SL; pectoral fin length 19.3% SL; pelvic fin length 16.7% SL; dorsal fin base length 17.1% SL; anal fin base length 8.8% SL; snout length 43.9% HL; head width 70.5% HL; orbital diameter 21.1% HL; interorbital width 28.1% HL; and mouth width 40.4% HL.

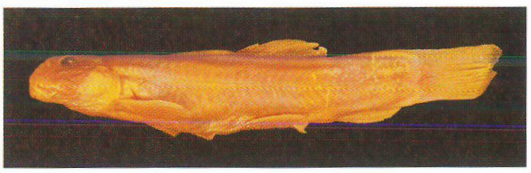


Figure 32. Holotype of *Noemacheilus breviceps* Smith, 1945; USNM 117751; 56.9 mm SL; collection location: Mae Mao River, Fang District, Chiang Mai Province; identified in the present study as *Schistura breviceps* (Smith, 1945). Photo credit: Veera Vilasri, National Science Museum, Thailand.

32. USNM 107946, 41.0 mm SL, holotype of *Noemacheilus deignani* Smith, 1945; mountain brook, Kao Sabap, southeastern Siam (=Khao Sabab Mountain, Chantaburi Province); 29 April 1937 [Described by Smith (1945), p. 320, fig. 70; identified in the present study as *Schistura kohchangensis* (Smith, 1933) following Kottelat (1990)] (Fig. 33).

Dorsal rays iv,7; anal rays iii,5; pectoral rays i,11; pelvic rays i,7; branched caudal rays 8+8; unbranched caudal rays 9+5; and vertebrae 21+12=33. Head length 21.3% SL; predorsal length 52.4% SL; prepectoral length 22.0% SL; prepelvic length 48.8% SL; preanal length 75.6% SL; body depth at dorsal origin 18.3% SL; caudal peduncle depth 12.8% SL; caudal peduncle length 15.2% SL; pectoral fin length 21.3% SL; pelvic fin length 18.3% SL; dorsal fin base length 14.0% SL; anal fin base length 8.5% SL; snout length 45.7% HL; head width 68.6% HL; orbital diameter 17.1% HL; interorbital width 45.7% HL; and mouth width 25.7% HL.



Figure 33. Holotype of *Noemacheilus deignani* Smith, 1945; USNM 107946; 41.0 mm SL; collection location: Khao Sabab Mountain, Chantaburi Province; identified in the present study as *Schistura kohchangensis* (Smith, 1933). Photo credit: Sandra J. Raredon, Smithsonian Institution.

33. USNM 117753, 43.3 mm SL, holotype of *Noemacheilus menanensis* Smith, 1945; Menam Kon, trib. of Menam Nan, at Ban Khana, northern Siam (=Nam Kon River, Ban Khanna Village, Phraya Kaew Subdistrict, Chiang Klang District, Nan Province); H.G. Deignan, 20 April 1936 [Described by Smith (1945), p. 310, fig. 65; identified in the present study as *Schistura menanensis* (Smith, 1945) following Kottelat (1990)] (Fig. 34).

Dorsal rays iv,8; anal rays ii,5; pectoral rays i,9; pelvic rays i,7; branched caudal rays 9+7; unbranched caudal rays 9+7; and vertebrae 22+12=34. Head length 24.9% SL; predorsal length 55.5% SL; prepectoral length 24.9% SL; prepelvic length 47.1% SL; preanal length 78.6% SL; body depth at dorsal origin 13.9% SL; caudal peduncle depth 13.9% SL; caudal peduncle length14.5% SL; pectoral fin length 19.1% SL; pelvic fin length 16.8% SL; dorsal fin base length 16.8% SL; anal fin base length 8.7% SL; snout length 39.5% HL; head width 62.8% HL; orbital diameter 20.9% HL; interorbital width 30.2% HL; and mouth width 27.9% HL.



Figure 34. Holotype of *Noemacheilus menanensis* Smith, 1945; USNM 117753; 43.3 mm SL; collection location: Nam Kon River, Ban Khanna Village, Phraya Kaew Subdistrict, Chiang Klang District, Nan Province; identified as *Schistura menanensis* (Smith, 1945). Photo credit: Sandra J. Raredon, Smithsonian Institution.

34. USNM 107944, 63.5 mm SL, holotype of *Noemacheilus reidi* Smith, 1945; Huey Mekong Kha, trib. Salwin, base of Doi Mekong Kha, northern Siam (=Huai Maekong Kha Stream, Doi Maekong Kha Mountain, Mae Sariang District, Mae Hong Son Province); 19 October 1936 [Described by Smith (1945), p. 313, fig. 67; identified in the present study as *Schistura reidi* (Smith, 1945) following Kottelat (1990)] (Fig. 35).

Dorsal rays iv,8; anal rays iii,5; pectoral rays i,10; pelvic rays i,7; branched caudal rays 9+8; unbranched caudal rays 9+6; and vertebrae 21+13=34. Head length 24.4% SL; predorsal length 53.2% SL; prepectoral length 25.6% SL; prepelvic length 55.1% SL; preanal length 78.7% SL; body depth at dorsal origin 16.1% SL; caudal peduncle depth 14.6% SL; caudal peduncle length 15.0% SL; pectoral fin length 18.5% SL; pelvic fin length 17.3% SL; dorsal fin base length 15.0% SL; anal fin base length 8.7% SL; snout length 41.9% HL; head width 58.1% HL; orbital diameter 17.7% HL; interorbital width 29.0% HL; and mouth width 29.0% HL.



Figure 35. Holotype of *Noemacheilus reidi* Smith, 1945; USNM 107944; 63.5 mm SL; collection location: Huai Maekong Kha Stream, Doi Maekong Kha Mountain, Mae Sariang District, Mae Hong Son Province; identified in the present study as *Schistura reidi* (Smith, 1945). Photo credit: Sandra J. Raredon, Smithsonian Institution.

35. USNM 107953, 85.9 mm SL, holotype of *Noemacheilus schultzi* Smith, 1945; Huey Melao, Doi Hua Mot, northern Siam (=Huai Mae Lao Stream, Doi Mod Mountain, Wiang Pa Pao District, Chiang Rai Province); 1 September 1934 [Described by Smith, 1945, p. 317, fig. 69; identified in the present study as *Schistura schultzi* (Smith, 1945) following Kottelat (1990)] (Fig. 36).

Dorsal rays iv,8; anal rays iii,6; pectoral rays i,10; pelvic rays i,7; branched caudal rays 9+8; unbranched caudal rays 12+8; and vertebrae 23+14=37. Head length 24.4% SL; predorsal length 51.4% SL; prepectoral length 24.3% SL; prepelvic length 53.5% SL; preanal length 77.9% SL; body depth at dorsal origin 16.8% SL; caudal peduncle depth 13.9% SL; caudal peduncle length 15.4% SL; pectoral fin length 19.2% SL; pelvic fin length 17.8% SL; dorsal fin base length 16.3% SL; anal fin base length 11.1% SL; snout length 39.3% HL; head width 69.2% HL; orbital diameter 12.0% HL; interorbital width 35.5% HL; and mouth width 40.6% HL.



Figure 36. Holotype of *Noemacheilus schultzi* Smith, 1945; USNM 107953; 85.9 mm SL; collection location: Huai Mae Lao Stream, Doi Mod Mountain, Wiang Pa Pao District, Chiang Rai Province; identified in the present study as *Schistura schultzi* (Smith, 1945). Photo credit: Sandra J. Raredon, Smithsonian Institution.

Order Siluriformes

Family Ariidae

36. USNM 90310, 205.6 mm SL, holotype

of *Arius sciurus* Smith, 1931; Tapi River, Bandon, peninsular Siam (=Tapi River, Mueang Surat Thani District, Surat Thani Province); H.M. Smith, 30 September 1923 [Described by Smith (1931), p. 30; identified in the present study as *Arius microcephalus* Bleeker, 1855 following Kailola (2004)] (Fig. 37).

Dorsal rays II,7; anal fin rays v,15; pectoral fin rays I, 10; pelvic fin rays i, 5; branched caudal rays 6+7; unbranched caudal rays 22+22; and vertebrae 24+23=47. Head length 31.1% SL; predorsal length 41.9% SL; prepectoral length 33.8% SL; prepelvic length 56.7% SL; preanal length 72.1% SL; body depth at dorsal origin 23.8% SL; caudal peduncle depth 7.8% SL; caudal peduncle length 14.4% SL; pectoral fin length 22.1% SL; pelvic fin length 14.2% SL; dorsal fin base length 12.3% SL; anal fin base length 15.4% SL; snout length 36.7% HL; head width 64.7% HL; orbital diameter 19.0% HL; and interorbital width 48.9% HL.

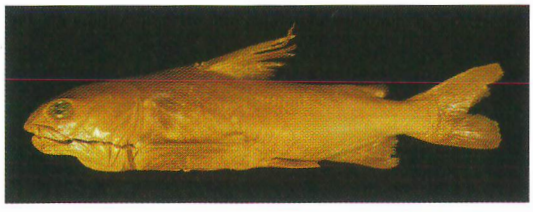


Figure 37. Holotype of *Arius sciurus* Smith, 1931; USNM 90310; 205.6 mm SL; collection location: Tapi River, Mueang Surat Thani District, Surat Thani Province; identified in the present study as *Arius microcephalus* (Bleeker, 1855). Photo credit: Veera Vilasri, National Science Museum, Thailand.

Family Pangasiidae

37. USNM 90308, 153.5 mm SL, holotype of *Pangasius beani* Smith, 1931; Klong Ban Poh, off Lopburi River, near Ayuthia, central Siam (=Khlong Ban Poh Canal, Ban Poh Subdistrict, Bang Pa-in District, Ayutthaya Province); H.M. Smith, 26 November 1923 [Described by Smith (1931), p. 26; identified in the present study as *Pangasius sanitwongsei* Smith, 1931 following Kottelat (1984)] (Fig. 38).

Dorsal rays II,5; anal rays iv,26; pectoral rays I,13; pelvic rays i,5. Head length 30.1% SL; predorsal length 39.5% SL; prepectoral length 30.9% SL; prepelvic length 53.9% SL; preanal length 66.6% SL; body depth at dorsal origin 31.1% SL; caudal peduncle depth 8.1% SL; caudal peduncle length 12.5% SL; pectoral fin length 18.9% SL; pelvic fin length 19.1% SL; dorsal fin base length 10.3% SL; anal fin base length 24.3% SL; snout length 48.3% HL; head width 71.7% HL; orbital diameter 15.8% HL; and interorbital width 64.6% HL.

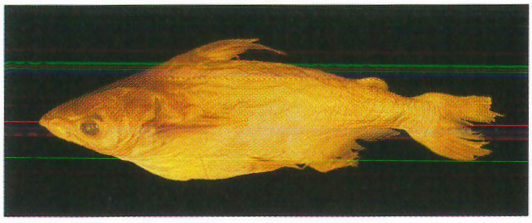


Figure 38. Holotype of *Pangasius beani* Smith, 1931; USNM 90308; 153.5 mm SL; collection location: Khlong Ban Poh Canal, Ban Poh Subdistrict, Bang Pa-in District, Ayutthaya Province; identified in the present study as *Pangasius sanitwongsei* (Smith, 1931). Photo credit: Veera Vilasri, National Science Museum, Thailand.

38. USNM 90306, 212.5 mm SL, holotype of *Pangasius cultratus* Smith, 1931; Tapi River, Bandon, Siam (=Tapi River, Mueang Surat Thani District, Surat Thani Province); H.M. Smith, 30 September 1923 [Described by Smith (1931), p. 25; identified in the present study as *Pseudolais pleurotaenia* (Sauvage, 1878) following Ferraris (2007)] (Fig. 39).

Dorsal rays II,7; anal rays iv,39; pectoral rays I,10; pelvic rays i,5; and vertebrae 17+28=45. Head length 20.5% SL; predorsal length 32.8% SL; prepectoral length 20.3% SL; prepelvic length 43.7% SL; preanal length

57.2% SL; body depth at dorsal origin 27.8% SL; caudal peduncle depth 8.2% SL; caudal peduncle length 14.3% SL; pectoral fin length 18.5% SL; pelvic fin length 7.9% SL; dorsal fin base length 7.6% SL; anal fin base length 36.4% SL; snout length 36.0% HL; head width 68.7% HL; orbital diameter 31.7% HL; interorbital width 53.8% HL; and mouth width 38.9% HL.

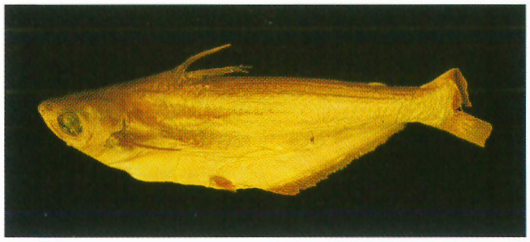


Figure 39. Holotype of *Pangasius cultratus* Smith, 1931; USNM 90306; 212.5 mm SL; collection location: Tapi River, Mueang Surat Thani District, Surat Thani Province; identified in the present study as *Pseudolais pleurotaenia* (Sauvage, 1878). Photo credit: Veera Vilasri, National Science Museum, Thailand.

39. USNM 90309, 162.1 mm SL, holotype of *Pangasius fowleri* Smith, 1931; Lopburi River, at Lopburi, central Siam (=Lopburi River, Mueang Lop Buri District, Lop Buri Province); H.M. Smith, 22 October 1926 [Described by Smith (1931), p. 28; identified in the present study with *Pseudolais pleurotaenia* (Sauvage, 1878) following Ferraris (2007)] (Fig. 40).

Dorsal rays II,7; anal rays iv,38; pectoral rays I,11; pelvic rays i,5; and vertebrae 17+28=45. Head length 20.7% SL; predorsal length 31.2% SL; prepectoral length 21.4% SL; prepelvic length 43.2% SL; preanal length 57.3% SL; body depth at dorsal origin 26.9% SL; caudal peduncle depth 8.7% SL; caudal peduncle length 15.3% SL; pectoral fin length 16.6% SL; pelvic fin length8.9% SL; dorsal fin base length 8.8% SL; anal fin base length 33.2% SL; snout length 38.9% HL; head width 70.3% HL; orbital diameter 25.6% HL; interorbital width 54.5% HL; and mouth width 31.8% HL.

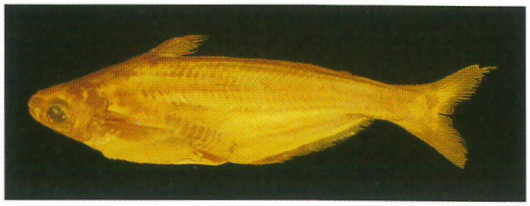


Figure 40. Holotype of *Pangasius fowleri* Smith, 1931; USNM 90309; 162.1 mm SL; collection location: Lopburi River, Mueang Lop Buri District, Lop Buri Province; identified in the present study as *Pseudolais pleurotaenia* (Sauvage, 1878). Photo credit: Veera Vilasri, National Science Museum, Thailand.

Family Siluridae

40. USNM 109787, 193.3 mm SL, holotype of *Kryptopterus moorei* Smith, 1945; central Siam, Klong Ban Poh, off Menam Chao Phya, Paknampo (=Khlong Poh Canal, Mueang Nakhon Sawan district, Nakhon Sawan Province); H.M. Smith, 26 November 1923 [Described by Smith, 1945, p. 342, fig. 78; identified in the present study as *Micronema cheveyi* (Durand, 1940) following Kottelat (2013)] (Fig. 41).

Anal rays iii,64; pectoral rays I,16; pelvic rays i,7; and vertebrae 11+42=53. Head length 18.8% SL; prepectoral length 20.6% SL; prepelvic length 30.9% SL; preanal length 36.7% SL; body depth at anal origin 25.8% SL; caudal peduncle depth 6.9% SL; caudal peduncle length 4.1% SL; pectoral fin length 18.5% SL; pelvic fin length 6.0% SL; anal fin base length 63.0% SL; snout length 45.2% HL; head width 64.3% HL; orbital diameter 18.9% HL; and interorbital width 58.1% HL.



Figure 41. Holotype of *Kryptopterus moorei* Smith, 1945; USNM 109787; 193.3 mm SL; collection location: Khlong Poh Canal, Mueang Nakhon Sawan District, Nakhon Sawan Province; identified in the present study as *Micronema cheveyi* (Durand, 1940). Photo credit: Veera Vilasri, National Science Museum, Thailand.

Family Sisoridae

41. USNM 117754, 53.5 mm SL, holotype of *Glyptothorax buchanani* Smith, 1945; Metum, tributary of Mechem, northern Siam (=Huai Mae Tum Stream, off Mae Chem River, Mae Chem District, Chiang Mai Province); A.R. Buchanan, 20 June 1935 [Described by Smith (1945), p. 402, fig. 89; valid as *Glyptothorax buchanani* Smith, 1945] (Fig. 42)

Dorsal rays II,7; anal rays iv, 9; pectoral rays I,9; pelvic rays i,5; branched caudal rays 7+8; unbranched caudal rays 13+14; and vertebrae 18+18=36. Head length 27.2% SL; predorsal length 37.4% SL; prepectoral length 24.2% SL; prepelvic length 49.5% SL; preanal length 66.6% SL; body depth at dorsal origin 20.7% SL; caudal peduncle depth 11.6% SL; caudal peduncle length 18.8% SL; pectoral fin length 27.6% SL; pelvic fin length 20.1% SL; dorsal fin base length 16.8% SL; anal fin base length 18.2% SL; nasal barbel length 6.1% SL; maxillary barbel length 15.9% SL; outer mandibular barbel length 16.8% SL; inner mandibular barbel length 9.4% SL; thoracic adhesive apparatus length 17.3% SL; thoracic adhesive apparatus width 11.2% SL; snout length 46.6% HL; head width 89.0% HL; orbital diameter 12.0% HL; interorbital width 36.1% HL; and mouth width 36.1% HL.

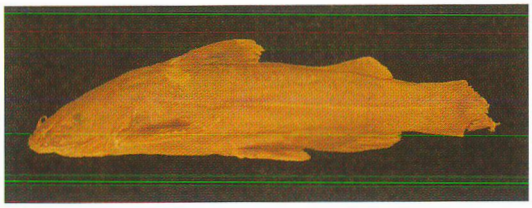


Figure 42. Holotype of *Glyptothorax buchanani* Smith, 1945; USNM 117754; 53.5 mm SL; collection location: Huai Mae Tum Stream, off Mae Chem River, Mae Chem District, Chiang Mai Province; identified in the present study as *Glyptothorax buchanani* Smith, 1945. Photo credit: Veera Vilasri, National Science Museum, Thailand.

42. USNM 109820, 52.0 mm SL, holotype of *Glyptothorax callopterus* Smith, 1945; water fall stream on Kao Chong near Trang, peninsular Siam (=Khao Chong Mountain, Trang Province); 2 September 1933 [Described by Smith (1945), p. 400, fig. 87; valid as *Glyptothorax callopterus* Smith, 1945] (Fig. 43).

Dorsal rays II,6; anal rays v,11; pectoral rays I,7; pelvic rays i,5; branched caudal rays 7+8; unbranched caudal rays 13+13; and vertebrae 17+17=34. Head length 29.3% SL; predorsal length 41.8% SL; prepectoral length 27.9% SL; prepelvic length 51.4% SL; preanal length 69.2% SL; body depth at dorsal origin 26.0% SL; caudal peduncle depth 10.6% SL; caudal peduncle length 17.3% SL; pectoral fin length 24.5% SL; pelvic fin length 17.3% SL; dorsal fin base length 13.9% SL; anal fin base length 17.8% SL; nasal barbel length 7.2% SL; maxillary barbel length 25.0% SL; outer mandibular barbel length 15.4% SL; inner mandibular barbel length 12.5% SL; thoracic adhesive apparatus length 16.4% SL; thoracic adhesive apparatus width 9.6% SL; snout length 50.8% HL; head width 80.3% HL; orbital diameter 13.1% HL; interorbital width 29.5% HL; and mouth width 44.3% HL.

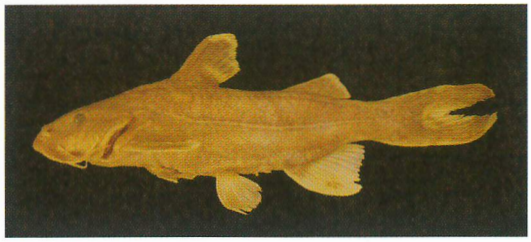


Figure 43. Holotype of *Glyptothorax callopterus* Smith, 1945; USNM 109820; 52.0 mm SL; collection location: Khao Chong Mountain, Trang Province; identified in the present study as *Glyptothorax callopterus* Smith, 1945. Photo credit: Veera Vilasri, National Science Museum, Thailand.

Order Beloniformes
Family Adrianichthyidae

43. USNM 107958, 12.8 mm SL, holotype of *Oryzias minutillus* Smith, 1945; canal, Bangkok, central Siam (=a canal in Bangkok); 10 May 1934 [Described by Smith (1945), p. 424, fig. 95; valid as *Oryzias minutillus* Smith, 1945] (Fig. 44).

Vertebrae 10+17=27. Head length 29.4% SL; predorsal length 78.8% SL; preanal length 56.9% SL; body depth at anal origin 23.5% SL; caudal peduncle length 13.7% SL; snout length 26.7% HL; head width 66.7% HL; orbital diameter 40.0% HL; interorbital width 46.7% HL; and mouth width 40.0% HL.



Figure 44. Holotype of *Oryzias minutillus* Smith, 1945; USNM 107958; 12.8 mm SL; collection location: a canal in Bangkok; identified in the present study as *Oryzias minutillus* Smith, 1945. Photo credit: Sandra J. Raredon, Smithsonian Institution.

Order Perciformes
Family Gobiidae

44. USNM 119572, 67.6 mm SL, holotype of *Cryptocentrus callopterus* Smith, 1945; Chantabun Estuary, southeastern Siam (=estuary of Chanthaburi River, Chanthaburi Province); H.M. Smith, 14 June 1926 [Described by Smith (1945), p. 552, pl. 9 (b); valid as *Cryptocentrus callopterus* Smith, 1945] (Fig. 45).

Dorsal rays VI-I,10; anal rays I,10; pectoral rays 18; pelvic rays I,5; branched caudal rays 7+7; unbranched caudal rays 9+7; scales in longitudinal series 74 on body, with 4 on the base of the caudal fin; upper transverse scale rows 10 ½; lower transverse scale rows 14; and vertebrae 10+16=26. Head length 28.5% SL; predorsal length 32.9% SL; prepectoral length 30.3% SL; prepelvic length 32.8% SL; preanal length 61.0% SL; body depth at dorsal origin 19.6% SL; caudal peduncle depth 11.1% SL; caudal peduncle length 16.6% SL; pectoral fin length 20.3% SL; pelvic fin length 21.5% SL; dorsal fin base length 56.6% SL; anal fin base length 27.0% SL; snout length 26.0% HL; head width 57.1% HL; orbital diameter 26.0% HL; interorbital width 7.8% HL; and mouth width 36.4% HL.

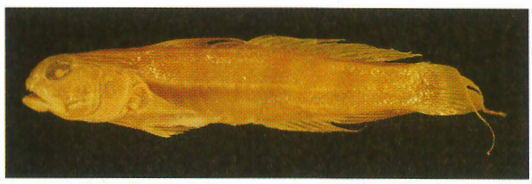


Figure 45. Holotype of *Cryptocentrus callopterus* Smith, 1945; USNM 119572; 67.6 mm SL; collection location: estuary of Chanthaburi River, Chanthaburi Province; identified in the present study as *Cryptocentrus callopterus* Smith, 1945. Photo credit: Veera Vilasri, National Science Museum, Thailand.

45. USNM 90322, 98.0 mm SL, holotype of *Cryptocentrus leonis* Smith, 1931; estuary of Chantabun River, Lem Sing, southeastern

Siam (=estuary of Chanthaburi River, Laem Sing District, Chanthaburi Province); 17 July 1928 [Described by Smith (1931), p. 46, fig. 21; valid as *Cryptocentrus leonis* Smith, 1931] (Fig. 46).

Dorsal rays VI-I,10; anal rays I,10; pectoral rays 18; pelvic rays I,5; branched caudal rays 7+6; unbranched caudal rays 8+8; and vertebrae 10+16=26. Head length 31.3% SL; predorsal length 35.8% SL; prepectoral length 32.7% SL; prepelvic length 33.0% SL; preanal length 60.1% SL; body depth at dorsal origin 16.4% SL; caudal peduncle depth 9.0% SL; caudal peduncle length 16.3% SL; dorsal fin base length 52.1% SL; anal fin base length 24.7% SL; snout length 21.9% HL; head width 50.8% HL; orbital diameter 17.6% HL; interorbital width 8.4% HL; and mouth width 36.8% HL.



Figure 46. Holotype of *Cryptocentrus leonis* Smith, 1931; USNM 90322; 98.0 mm SL; collection location: estuary of Chanthaburi River, Laem Sing District, Chanthaburi Province; identified in the present study as *Cryptocentrus leonis* Smith, 1931. Photo credit: Sandra J. Raredon, Smithsonian Institution.

46. USNM 119580, 41.3 mm SL, holotype of *Ctenogobius cephalopardus* Smith, 1945; Huey Melao, Doi Hua Mot, northern Siam (=Huai Mae Lao Stream, Doi Mod Mountain, Wiang Pa Pao District, Chiang Rai Province); Layang Gaddi, 14 August 1934 [Described by Smith (1945), p. 546, fig. 106; identified in the present study as *Rhinogobius mekongianus* (Pellegrin and Fang, 1940) following Rainboth (1996b)] (Fig. 47).

Dorsal rays VI-I,8; anal rays I,7; pectoral ray 17; pelvic rays I,5; branched caudal rays 7+6; unbranched caudal rays 9+10; scales in longitudinal series 30 on body, with 1 on the base of the caudal fin; upper transverse scale rows 5 ½; lower transverse scale rows 4; circumpeduncular scales 12; and vertebrae 11+17=28. Head length 30.9% SL; predorsal length 38.8% SL; prepectoral length 30.9% SL; prepelvic length 32.1% SL; preanal length 66.1% SL; body depth at dorsal origin 17.0% SL; caudal peduncle depth 12.1% SL; caudal peduncle length 26.7% SL; pectoral fin length 27.3% SL; dorsal fin base length 37.0% SL; anal fin base length 13.3% SL; snout length 27.5% HL; head width 51.0% HL; orbital diameter 23.5% HL; interorbital width 11.8% HL; and mouth width 35.3% HL.

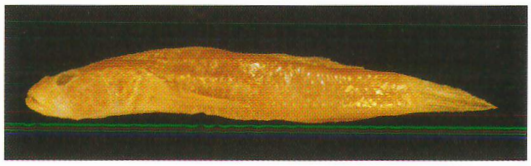


Figure 47. Holotype of *Ctenogobius cephalopardus* Smith, 1945; USNM 119580; 41.3 mm SL; collection location: Huai Mae Lao Stream, Doi Mod Mountain, Wiang Pa Pao District, Chiang Rai Province; identified in the present study as *Rhinogobius mekongianus* (Pellegrin and Fang, 1940). Photo credit: Veera Vilasri, National Science Museum, Thailand.

47. USNM 90316, 25.7 mm SL, holotype of *Eugnathogobius microps* Smith, 1931; lower Bangpakong River, central Siam (=Bang Pakong River, Chachoengsao Province); H.M. Smith, 1 July 1923 [Described by Smith (1931), p. 37, fig. 18; valid as *Eugnathogobius microps* Smith, 1931] (Fig. 48).

Dorsal rays VI-I,6; anal rays I,6; pectoral rays 18; pelvic rays I,5; unbranched caudal rays 7+6; branched caudal rays 10+9; scales in longitudinal series 26 on body, with 2 on the base of the caudal fin; upper transverse scale rows 6 ½; lower transverse scale rows 4; circumpeduncular scales 12; and vertebrae 10+16=26. Head length 37.0%

SL; predorsal length 43.8% SL; prepectoral length 38.9% SL; prepelvic length 35.0% SL; preanal length 67.1% SL; body depth at dorsal origin 20.4% SL; caudal peduncle depth 15.6% SL; caudal peduncle length 25.3% SL; pelvic fin length 22.4% SL; dorsal fin base length 35.0% SL; anal fin base length 14.6% SL; snout length 29.0% HL; head width 63.2% HL; orbital diameter 13.2% HL; interorbital width 21.1% HL; and mouth width 44.7% HL.



Figure 48. Holotype of *Eugnathogobius microps* Smith, 1931; USNM 90316; 25.7 mm SL; collection location: Bang Pakong River, Chachoengsao Province; identified in the present study as *Eugnathogobius microps* Smith, 1931. Photo credit: Veera Vilasri, National Science Museum, Thailand.

48. USNM 119604, 37.0 mm SL, holotype of *Gnathogobius aliceae* Smith, 1945; canal, Bangkok, central Siam (=a canal in Bangkok); H.M. Smith, 2 May 1931 [Described by Smith (1945), p. 523, fig. 104; identified in the present study as *Eugnathogobius kabilia* (Herre, 1940) following Larson (2009)] (Fig. 49).

Dorsal rays VI-I,7; anal rays I,7; pectoral rays 16; pelvic rays I,5; branched caudal rays 7+6; unbranched caudal rays 9+8; and vertebrae 10+16=26. Head length 32.4% SL; predorsal length 41.2% SL; prepectoral length 32.4% SL; prepelvic length 31.8% SL; preanal length 66.2% SL; body depth at dorsal origin 20.3% SL; caudal peduncle depth 14.2% SL; caudal peduncle length 25.0% SL; dorsal fin base length 38.5% SL; anal fin base length 15.5% SL; snout length 29.2% HL; head width 68.8% HL; orbital diameter 27.1% HL; interorbital width 33.3% HL; and mouth width 50.0% HL.

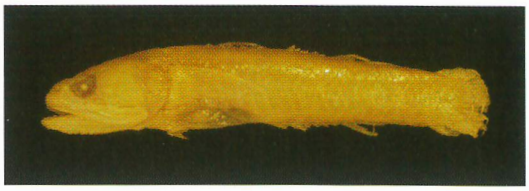


Figure 49. Holotype of *Gnathogobius aliceae* Smith, 1945; USNM 119604; 37.0 mm SL; collection location: a canal in Bangkok; identified in the present study as *Eugnathogobius kabilia* (Herre, 1940). Photo credit: Veera Vilasri, National Science Museum, Thailand.

49. USNM 90319, 12.0 mm SL, holotype of *Paragobiodon kerri* Smith, 1931; Koh Tao, Gulf of Siam (=Koh Tao Island, Koh Pha Ngan District, Surat Thani Province); 24 September 1928 [Described by Smith (1931), p. 42, fig. 20; identified in the present study as *Paragobiodon lacunicolus* (Kendall and Goldsborough, 1911) following Eschmeyer *et al.* (2018)] (Fig. 50).

Dorsal rays VI-I,9; anal rays I,9; branched caudal rays 7+6; unbranched caudal rays 8+6; and vertebrae 10+16=26. Head length 39.6% SL; predorsal length 35.4% SL; prepectoral length 37.5% SL; prepelvic length 33.3% SL; preanal length 62.5% SL; body depth at dorsal origin 29.2% SL; caudal peduncle depth 16.7% SL; caudal peduncle length 20.8% SL; dorsal fin base length 52.1% SL; anal fin base length 20.8% SL; snout length 31.6% HL; head width 84.2% HL; orbital diameter 26.3% HL; and interorbital width 26.3% HL.



Figure 50. Holotype of *Paragobiodon kerri* Smith, 1931; USNM 90319; 12.0 mm SL; collection location: Koh Tao Island, Koh Pha Ngan District, Surat Thani Province; identified in the present study as *Paragobiodon lacunicolus* (Kendall and Goldsborough, 1911). Photo credit: Sandra J. Raredon, Smithsonian Institution.

50. USNM 90317, 19.3 mm SL, holotype of *Pipidonia quinquecincta* Smith, 1931; tide pool, Koh Pipidon, western Siam, Bay of Bengal (=Koh Pipidon Island, Krabi Province); H.M. Smith, 10 March 1925 [Described by Smith, 1931, p. 39, fig. 19; identified in the present study as *Gobiopsis quinquecincta* (Smith, 1931) following Akihito (1984)] (Fig. 51).

Dorsal rays VI-I,10; anal rays I,9; pectoral rays 17; pelvic rays I,5; branched caudal rays 8+6; unbranched caudal rays 5+6; and vertebrae 10+16=26. Head length 31.2% SL; predorsal length 40.3% SL; prepectoral length 33.8% SL; prepelvic length 31.2% SL; preanal length 62.3% SL; body depth at dorsal origin 14.3% SL; caudal peduncle depth 13.0% SL; caudal peduncle length 15.6% SL; pelvic fin length 22.1% SL; dorsal fin base length 50.7% SL; anal fin base length 22.1% SL; snout length 29.2% HL; head width 66.7% HL; orbital diameter 20.8% HL; interorbital width 16.7% HL; and mouth width 33.3% HL.



Figure 51. Holotype of *Pipidonia quinquecincta* Smith, 1931; USNM 90317, 19.3 mm SL; collection location: Koh Pipidon Island, Krabi Province; identified in the present study as *Gobiopsis quinquecincta* (Smith, 1931). Photo credit: Sandra J. Raredon, Smithsonian Institution.

51. USNM 90320, 60.0 mm SL, holotype of *Rhinogobius similis* Smith, 1931; Bandon Bight, Gulf of Siam (=Bandon Bay, Mueang Surat Thani District, Surat Thani Province); 21 September 1923 [Described by Smith (1931), p. 43; identified in the present study as *Acentrogobius caninus* (Valenciennes, 1837) following Kottelat (2013)] (Fig. 52).

Dorsal rays VI-I,9; anal rays I,9; pectoral rays 18; pelvic rays I,5; branched caudal rays 7+6; unbranched caudal rays 10+8; scales in longitudinal series 27 on body, with 1 on the base of the caudal fin; upper transverse scale rows 6 ½; lower transverse scale rows 5; predorsal scales 16; circumpeduncular scales 12; and vertebrae 10+16=26. Head length 28.8% SL; predorsal length 35.4% SL; prepectoral length 30.8% SL; prepelvic length 32.5% SL; preanal length 58.3% SL; body depth at dorsal origin 21.3% SL; caudal peduncle depth 13.3% SL; caudal peduncle length 23.8% SL; pectoral fin length 23.8% SL; pelvic fin length 23.3% SL; dorsal fin base length 45.4% SL; anal fin base length 20.8% SL; snout length 31.9% HL; orbital diameter 31.9% HL; interorbital width 5.8% HL; and mouth width 42.1% HL.

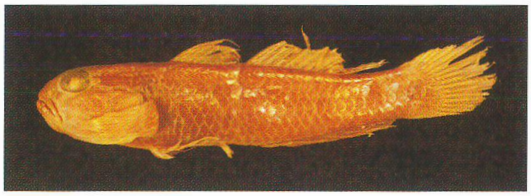


Figure 52. Holotype of *Rhinogobius similis* Smith, 1931; USNM 90320; 60.0 mm SL; collection location: Bandon Bay, Mueang Surat Thani District, Surat Thani Province; identified in the present study as *Acentrogobius caninus* (Valenciennes, 1837). Photo credit: Veera Vilasri, National Science Museum, Thailand.

52. USNM 119646, 31.0 mm SL, holotype of

Vaimosa rambaiae Smith, 1945; small canal, Bangkok, central Siam (=a canal in Bangkok); Nai Pongsi, 28 May 1931[Described by Smith (1945), p. 538, pl. 9(a); identified in the present study as *Mugilogobius rambaiae* (Smith, 1945) following Larson in Randall & Lim (2000)] (Fig. 53).

Dorsal rays VI-I,8; anal rays I,7; pectoral rays 14; pelvic rays I,5; branched caudal rays 7+6; unbranched caudal rays 9+8; scales in longitudinal series 40 on body, with 1 on the base of the caudal fin; upper transverse scale rows 8 ½; lower transverse scale rows 7; predorsal scales 19; circumpeduncular scales 12; and vertebrae 10+16=26. Head length 29.8% SL; predorsal length 40.3% SL; prepectoral length 30.7% SL; prepelvic length 32.3% SL; preanal length 61.3% SL; body depth at dorsal origin 27.4% SL; caudal peduncle depth 16.1% SL; caudal peduncle length 23.4% SL; dorsal fin base length 43.6% SL; anal fin base length 17.7% SL; snout length 27.0% HL; head width 78.4% HL; orbital diameter 27.0% HL; interorbital width 21.6% HL; and mouth width 40.5% HL.



Figure 53. Holotype of *Vaimosa rambaiae* Smith, 1945; USNM 119646; 31.0 mm SL; collection location: a canal in Bangkok; identified in the present study as *Mugilogobius rambaiae* (Smith, 1945). Photo credit: Veera Vilasri, National Science Museum, Thailand.

Family Microdesmidae

53. USNM 119639, 21.0 mm SL, holotype of *Ptereleotris stigmaturus* Smith, 1945; Chantabun River, estuary, southeastern Siam (=estuary of Chanthaburi River, Chanthaburi Province); H.M. Smith, 5 April 1930 [Described by Smith (1945), p. 511, fig. 102; identified in the present study as *Parioglossus philippinus* (Herre, 1945) following Kottelat (2013)] (Fig. 54).

Dorsal rays VI-I,18; anal rays I,18; pectoral ray 16; pelvic rays I,4; branched caudal rays 7+6; unbranched caudal rays 12+11; and vertebrae 10+16=26. Head length 23.8% SL; predorsal length 33.3% SL; prepectoral length 23.8% SL; prepelvic length 28.6% SL; preanal length 59.5% SL; body depth at dorsal origin 16.7% SL; caudal peduncle depth 10.7% SL; caudal peduncle length 11.9% SL; dorsal fin base length 56.0% SL; anal fin base length 32.1% SL; snout length 25.0% HL; head width 45.0% HL; orbital diameter 35.0% HL; interorbital width 35.0% HL; and mouth width 25.0% HL.



Figure 54. Holotype of *Ptereleotris stigmaturus* Smith, 1945; USNM 119639; 21.0 mm SL; collection location: an estuary of the Chanthaburi River, Chanthaburi Province; identified in the present study as *Parioglossus philippinus* (Herre, 1945). Photo credit: Sandra J. Raredon, Smithsonian Institution.

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