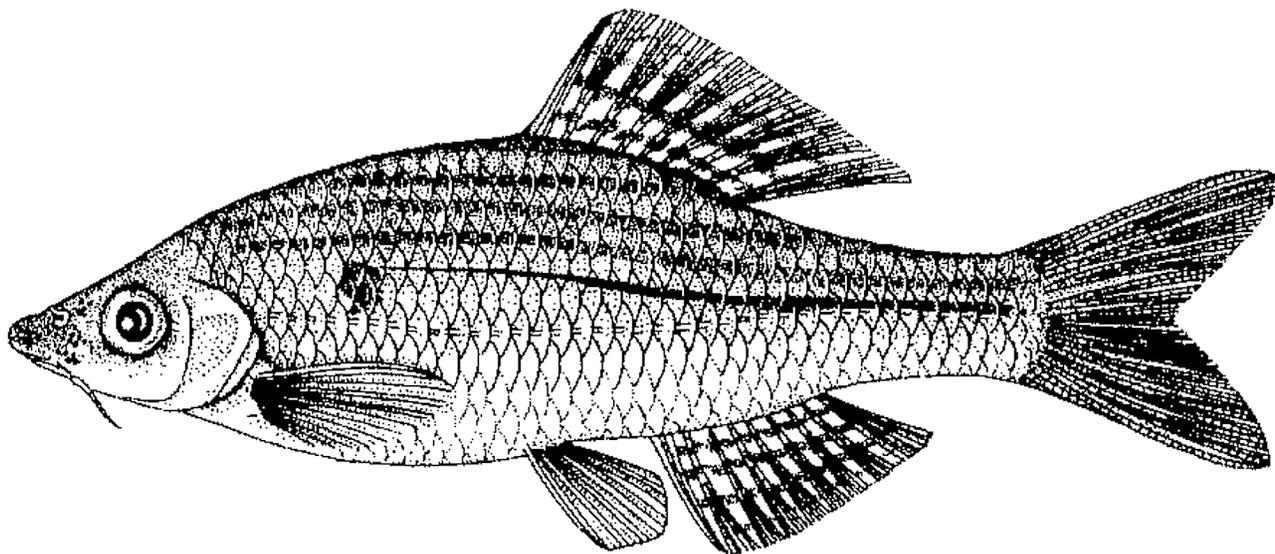


## Order CYPRINIFORMES

## Bitterlings

## Family ACHEILOGNATHIDAE

Bleeker 1863



*Acheilognathus majusculus*, holotype, male, 96.4 mm SL. Illustration by Youn Choi. From: Kim, I.-S. and H. Yang. 1998. *Acheilognathus majusculus*, a new bitterling (Pisces, Cyprinidae) from Korea, with revised key to species of the genus *Acheilognathus* of Korea. Korean Journal of Biological Sciences 2 (1): 27–31.

***Acheilognathus***

Bleeker 1859

ἄ, Greek privative, i.e., without; *cheilos* (Gr. χεῖλος), lip, *gnáthos* (Gr. γνάθος), jaw, referring to lower jaw of *A. melanogaster* without (or with only a lateral) labial fold

***Acheilognathus amurensis* (Holčik 1962) -ensis**, Latin suffix denoting place: Amur River system (Russia and China), where it is endemic

***Acheilognathus asmussii* (Dybowski 1872)** patronym not identified, possibly in honor of German entomologist Eduard Assmus (1838–1882) [if correct, Dybowski misspelled the name]

***Acheilognathus barbatulus* Günther 1873** diminutive of *barbatus* (L.), bearded, i.e., with a small beard, referring to its “pair of very short barbels”

***Acheilognathus barbatus* Nichols 1926** Latin for bearded, referring to well-developed terminal barbel (compared with the barbelless *A. gracilis*, described in the same paper)

***Acheilognathus binidentatus* Li 2001** *bini* (L.), two by two; *dentatus* (L.), toothed, but Li says name means “two spines,” referring to two unbranched rays (not spines) on pelvic fin

***Acheilognathus brevicaudatus* Chen & Li 1987** *brevis* (L.), short; *caudatus* (L.), tailed, referring to its shorter caudal peduncle compared with *A. elongatus*

***Acheilognathus changtingensis* Yang, Zhu, Xiong & Liu 2011 -ensis**, Latin suffix denoting place: Changting County, Fujian Province, China, where type locality (Hanjiang River) is situated

***Acheilognathus chankaensis* (Dybowski 1872) -ensis**, Latin suffix denoting place: Lake Khanka, southeastern Russia, type locality

***Acheilognathus coreanus* Steindachner 1892 -anus** (L.), belonging to: Coreā (alternate spelling of Korea), referring to Seoul, South Korea, type

locality

***Acheilognathus cyanostigma* Jordan & Fowler 1903** *cyano-*, from *kýanos* (Gr. κύανος), dark blue; *stigma* (Gr. στίγμα), mark or spot, referring to its blue-black lateral stripe

***Acheilognathus deignani* (Smith 1945)** in honor of Herbert Girton Deignan (1906–1968), Associate Curator of Birds, U.S. National Museum, who collected holotype

***Acheilognathus elongatoides* Kottelat 2001 -oides**, Neo-Latin from *eídos* (Gr. εἶδος), form or shape: replacement name for *A. elongatus* Mai 1978 (preoccupied by *A. elongatus*), probably referring to its long, compressed body, longer than the morphologically similar *Pararhodeus* (=Rhodeus) *fangi*

***Acheilognathus elongatus* (Regan 1908)** Latin or prolonged, referring to its more elongate body compared with *A. atranalis* (=Acanthorhodeus *chankaensis*)

***Acheilognathus fasciodorsalis* Nguyen 2001** *fascia* (L.), band; *dorsalis* (L.), of the back, referring to three black stripes on dorsal fin

***Acheilognathus gracilis* Nichols 1926** Latin or thin or slender, probably referring to its body shape compared with *A. barbatus* (described in the same paper), which has an elevated nape

***Acheilognathus hypselonotus* (Bleeker 1871)** *hypsēlós* (Gr. ὑψηλός), high; *notus*, from *nótos* (Gr. νότος), back, referring to convex body shape (common to many congeners)

***Acheilognathus imberbis* Günther 1868** Latin for beardless, referring to its lack of barbels

***Acheilognathus imfasciodorsalis* Nguyen 2001** *im-*, from *in* (L.), not; *fascia* (L.), band; *dorsalis* (L.), of the back, lacking three black stripes on dorsal fin as seen on *A. fasciodorsalis*

***Acheilognathus kyphus* (Mai 1978)** apparent Latinization of Ky Phu,

name of stream in Bac Thai Province, Vietnam, presumed type locality or close to it

***Acheilognathus lanchiensis* (Herre & Lin 1936)** *-ensis*, Latin suffix denoting place: Lanchie, upper Tsien Tang River, Chekiang Province, China, type locality

***Acheilognathus longibarbatu* (Mai 1978)** *longus* (L.), long; *barbatus* (L.), bearded, referring to its long maxillary barbel, equal to or longer than eye diameter

***Acheilognathus longipinnis* Regan 1905** *longus* (L.), long; *pinnis*, scientific Neo-Latin adjective of *pinna* (L.), fin, referring to its long pectoral fin, nearly as long as head, extending to root of ventral

***Acheilognathus macromandibularis* Doi, Arai & Liu 1999** *macro-*, from *makrós* (Gr. μακρός), long or large; *mandibularis*, of or pertaining to a jaw, referring to its large mouth, reaching posteriorly to a vertical line through anterior margin of orbit

***Acheilognathus macropterus* (Bleeker 1871)** *macro-*, from *makrós* (Gr. μακρός), long or large; *pterus*, from *pterón* (Gr. πτερόν) or *ptéryx* (πτέρυξ), fin, probably referring to its long and high dorsal fin, the base of which is ~3 times longer than base of tail

***Acheilognathus majusculus* Kim & Yang 1998** Latin for somewhat greater, referring to larger body size compared with other bitterlings

***Acheilognathus melanogaster* Bleeker 1860** *mélanos* (Gr. μέλανος), genitive of *mélas* (μέλας), black; *gastér* (Gr. γαστήρ), belly or stomach, referring to its black abdomen

***Acheilognathus mengyangensis* Chen, Gong & Guo 2021** *-ensis*, Latin suffix denoting place: Mengyang River, Mengyang town, Pengzhou City, Sichuan Province, China, type locality

***Acheilognathus meridianus* (Wu 1939)** *-anus* (L.), belonging to: *meridies* (L.), the south, referring to its distribution in southern China

***Acheilognathus microphysa* Yang, Chu & Chen 1990** *micro-*, from *mikrós* (Gr. μικρός), small; *phýsa* (Gr. φύσα), bladder, referring to greatly reduced posterior chamber of air bladder

***Acheilognathus nanchongensis* Deng 1996** *-ensis*, Latin suffix denoting place: Nanchong, Sichuan Province, China, where type locality (Xi-Chong River) is situated [treated as a synonym of *A. omeiensis* by some workers]

***Acheilognathus nguyenvanhaoui* Nguyen, Tram & Ta 2013** in honor of ichthyologist Nguyễn Văn Hào, Hanoi University of Education

***Acheilognathus omeiensis* (Shih & Tchang 1934)** *-ensis*, Latin suffix denoting place: Omei, Sichuan Province, China, type locality

***Acheilognathus polylepis* (Wu 1964)** *polý* (Gr. πολύ), many; *lepís* (Gr. λεπίς), scale, having more lateral line scales than *A. barbatus* and *A. tonkinensis*

***Acheilognathus polyspinus* (Holcík 1972)** *polý* (Gr. πολύ), many; *spinus* (L.), spine, referring to large number of rays in dorsal and anal fins

***Acheilognathus rhombeus* (Temminck & Schlegel 1846)** scientific Neo-Latin from *rhómbos* (Gr. ῥόμβος), rhombus, presumably referring to rhomboid shape of body

***Acheilognathus striatus* Yang, Xiong, Tang & Liu 2010** Latin for grooved or furrowed (i.e., striped), referring to broad longitudinal stripe on body

***Acheilognathus tabira* Jordan & Thompson 1914** vernacular for this species at Lake Biwa, Japan

***Acheilognathus tabira erythropterus* Arai, Fujikawa & Nagata 2007** red-finned, from *erythrós* (Gr. ἐρυθρός), and *pterus*, from *pterón* (Gr. πτερόν) or *ptéryx* (πτέρυξ), fin, referring to anal fin edged with red in nuptial males

***Acheilognathus tabira jordani* Arai, Fujikawa & Nagata 2007** in honor of American ichthyologist David Starr Jordan (1851–1931), who contributed greatly to Japanese ichthyology, including the original description of *A. tabira*

***Acheilognathus tabira nakamurae* Arai, Fujikawa & Nagata 2007** in honor of Morizumi Nakamura (1914–1998), National Science Museum (Tokyo), for contributions to the systematics of Japanese bitterlings [although named after a man, “ae” is an acceptable way to form a genitive from a masculine noun that ends in “a”]

***Acheilognathus tabira tohokuensis* Arai, Fujikawa & Nagata 2007** *-ensis*, Latin suffix denoting place: Tohoku area of Japan, where it occurs

***Acheilognathus tonkinensis* (Vaillant 1892)** *-ensis*, Latin suffix denoting place: Tonkin, northern region of Vietnam, where type locality (Nam-kia River, affluent to River Noire) is situated

***Acheilognathus typus* (Bleeker 1863)** proposed as the type species of *Pseudoperilampus*, now a junior synonym of *Acheilognathus*

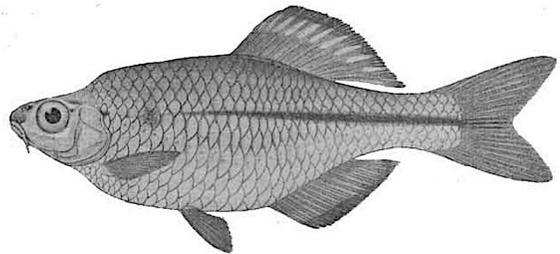
***Acheilognathus yamatsutae* Mori 1928** in honor of Mr. K. Yamatsuta, a teacher at the Mukden Higher Girls School, who “obtained ... a fine type specimen” [although named after a man, “ae” is an acceptable way to form a genitive from a masculine noun that ends in “a”]

### Paratanakia

Chang, Chen & Mayden 2014

*para-* (Gr. παρά), near, referring to morphological similarity of *P. himantegus* to *Tanakia*

***Paratanakia chii* (Miao 1934)** in honor of Chen-Ju Ch’i, Director of Bureau of Education of Honan (now Henan) Province, China, for his “kind support” of the author’s study of Kiangsu fishes



*Paratanakia chii*. From: Miao, C.-P. 1934. Notes on the fresh-water fishes of the southern part of Kiangsu I. Chinkiang. Contributions from the Biological Laboratory of the Science Society of China. (Zoological Series) 10 (3): 111–244.

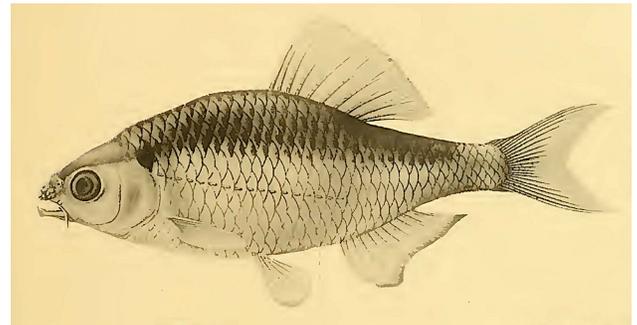
***Paratanakia himantegus* (Günther 1868)** *himántos* (Gr. ἱμάντος), genitive of *himás* (ἱμάς), leather strap or thong; *egus*, possibly an artificial Neo-Latin term derived from *hégéomai* (Gr. ἡγέομαι), to lead, i.e., handling or leading with a strap or leash, allusion not explained, possibly referring to long ovipositor of breeding females

### Pseudorhodeus

Chang, Chen & Mayden 2014

*pseudo-*, from *pseúdēs* (Gr. ψεύδης), false, referring to similarity to (e.g., incomplete lateral line) but not close relationship with *Rhodeus*

***Pseudorhodeus tanago* (Tanaka 1909)** Japanese vernacular for bitterling, translating as “fishes on palm”



First-published image of *Pseudorhodeus tanago* (as *Rhodeus miobuta*, a junior synonym). From: Tanaka, S. 1911. Figures and descriptions of the fishes of Japan, including Riukiu Islands, Bonin Islands, Formosa, Kurile Islands, Korea and southern Sakhalin. 1: 1–18, Pls. 1–5.

**Rhodeus**

Agassiz 1832

from *rhodon* (Gr. ῥόδον), rose, referring to rosy color of breeding male *R. amarus*

***Rhodeus albomarginatus* Li & Arai 2014** *albus* (L.), white; *marginatus* (L.), bordered or margined, referring to diagnostic white margin on anal fin of adult male

***Rhodeus amarus* (Bloch 1782)** Latin for bitter, referring to the taste of its roe (hence the common name, originally in German, bitterling)

***Rhodeus amurensis* (Vronsky 1967)** *-ensis*, Latin suffix denoting place: lower Amur River drainage, Russia, type locality

***Rhodeus atremius* (Jordan & Thompson 1914)**  $\acute{\alpha}$ , Greek privative, i.e., without; *tremius*, from *tréma* (Gr. τρήμα), hole or aperture, referring to “completely absent” lateral line

***Rhodeus caspius* Esmaeili, Sayyadzadeh, Japoshvili, Eagderi, Abbasi & Mousavi-Sabet 2020** Latin for Caspian, referring to Caspian Sea basin, Iran, type locality

***Rhodeus colchicus* Bogutskaya & Komlev 2001** *-icus* (L.), belonging to: Colchis, ancient name for the eastern coast of the Black Sea in Georgia, type locality

***Rhodeus cyanorostris* Li, Liao & Arai 2020** *cyano-*, from *kýanos* (Gr. κύανος), dark blue; *rostris*, Neo-Latin scientific adjective of *rostrum* (L.), snout, referring to distinctive blue snout of nuptial males



*Rhodeus cyanorostris*, nuptial male. From: Li, F., T.-Y. Liao and R. Arai. 2020. Two new species of *Rhodeus* (Teleostei: Cyprinidae: Acheilognathinae) from the River Yangtze, China. *Journal of Vertebrate Biology* 69 (1): [1–17].

***Rhodeus fangi* (Miao 1934)** in honor of ichthyologist Fang Ping-Wen (1903–1944), Metropolitan Museum of Natural History and Biological Laboratory of the Science Society of China, Nanjing, China

***Rhodeus flaviventris* Li, Arai & Liao 2020** *flavus* (L.), yellow; *ventris*, genitive of *venter* (L.), belly, referring to diagnostic yellow belly of adult males

***Rhodeus haradai* Arai, Suzuki & Shen 1990** in honor of I. Harada (possibly Japanese limnologist Isokiti Harada), who reported this species as *R. spinalis* in his *Freshwater Fishes of Hainan Island* (1943)

***Rhodeus hondae* (Jordan & Metz 1913)** in honor of K. Honda, director, Agricultural Station at Suigen (in present-day South Korea but then controlled by Japan), “who obtained for us a fine collection from the pond at this station” [although named after a man, “*ae*” is, per Latin grammar, an acceptable way to form a genitive from masculine nouns that end in “a”]

***Rhodeus laoensis* Kottelat, Doi & Musikasinthorn 1998** *-ensis*, Latin suffix denoting place: Laos, where it is endemic

***Rhodeus lighti* (Wu 1931)** in honor of American zoologist Sol Felty Light (1886–1947), University of California (Berkeley), for “constant help and encouragement” in Wu’s zoological studies during their three-year association at University of Amoy (now Xiamen University)

***Rhodeus mantschuricus* Mori 1934** *-icus* (L.), belonging to: Manchuria, referring to distribution in northeast Asia (Amur River basin of Russia and China)

***Rhodeus meridionalis* Karaman 1924** Latin for southern, allusion not explained, perhaps referring to Lake Dojran, type locality, in southern Macedonia at border with Greece

***Rhodeus monguonensis* (Li 1989)** *-ensis*, Latin suffix denoting place: Inner Mongolia Autonomous Region, where it occurs

***Rhodeus nigrodorsalis* Li, Liao & Arai 2020** *nigro-*, from *niger* (L.), dark or black; *dorsalis* (L.), of the back, referring to diagnostic black dorsal-fin membrane in adult males

***Rhodeus notatus* Nichols 1929** Latin for marked, probably referring to dark markings on caudal peduncle, middle caudal rays, behind upper angle of gill cleft, snout, and upper part of gill cover

***Rhodeus ocellatus* (Kner 1866)** Latin for having little eyes (ocelli), referring to black spot behind shoulder

***Rhodeus ocellatus kurumeus* Jordan & Thompson 1914** *-eus* (L.), adjectival suffix: Kurume, Kiusiu, Japan, type locality

***Rhodeus pseudosericeus* Arai, Jeon & Ueda 2001** *pseudo-*, from *psēúdēs* (Gr. ψεύδης), false, i.e., although this species may resemble *R. sericeus*, such an appearance is false

***Rhodeus rheinardti* (Tirant 1883)** patronym not identified, probably in honor of Pierre-Paul Rheinart (1840–1902, note spelling), a French official and administrator in Hué, Vietnam (type locality), who sent zoological specimens to Paris

***Rhodeus sciosemus* (Jordan & Thompson 1914)** *scio*, from *skiá* (Gr. σκιά), shade or shadow; *semus*, from *sēma* (Gr. σῆμα), token, seal or mark, probably referring to large black spot on dorsal fin (absent on *R. atremius*, described in the same paper)

***Rhodeus sericeus* (Pallas 1776)** Latin for silken or silky, allusion not explained, perhaps referring to soft, lustrous color of breeding males

***Rhodeus shitaiensis* Li & Arai 2011** *-ensis*, Latin suffix denoting place: Shitai County, Anhui Province, China, type locality

***Rhodeus sinensis* Günther 1868** *-ensis*, Latin suffix denoting place: Sinica (China), where it is endemic to the Yangtze River basin

***Rhodeus smithii* (Regan 1908)** in honor of British traveler, sportsman and naturalist Richard Gordon Smith (1858–1918), who collected specimens in Japan for the British Museum (Natural History), including holotype of this one

***Rhodeus spinalis* Oshima 1926** Latin for of or belonging to the spine (but used here to mean spiny), referring to its osseous dorsal- and anal-fin spines

***Rhodeus suigensis* (Mori 1935)** *-ensis*, Latin suffix denoting place: Suigen, South Korea, type locality

***Rhodeus uyekii* (Mori 1935)** in honor of Japanese botanist Homiki Uyeki (1882–1976), Suigen Agricultural College (type locality is in Suigen, South Korea, which, in 1935, was ruled by Japan)

**Sinorhodeus**

Li, Liao &amp; Arai 2017

*Sino-*, prefix for Sinica (China), where it is endemic to the Yangtze River drainage of Sichuan Province; *Rhodeus*, referring to morphological similarity to that genus



*Sinorhodeus macrolepis*, nuptial male. From: Li, F., T.-Y. Liao, R. Arai and L.-J. Zhao. 2017. *Sinorhodeus microlepis*, a new genus and species of bitterling from China (Teleostei: Cyprinidae: Acheilognathinae). *Zootaxa* 4353 (1): 69–88.

***Sinorhodeus microlepis* Li, Liao & Arai 2017** *micro-*, from *mikrós* (Gr. μικρός), small; *lepis* (Gr. λείπις), scale, referring to smaller and therefore more numerous scales compared with any species in *Rhodeus*

### **Tanakia**

**Jordan & Thompson 1914**

*-ia* (L. suffix), belonging to: Shigeo Tanaka (1878–1974), “accomplished” ichthyologist of the Imperial University of Tokyo, who described *T. shimazui* in 1908 and *Pseudorhodeus tanago* in 1909

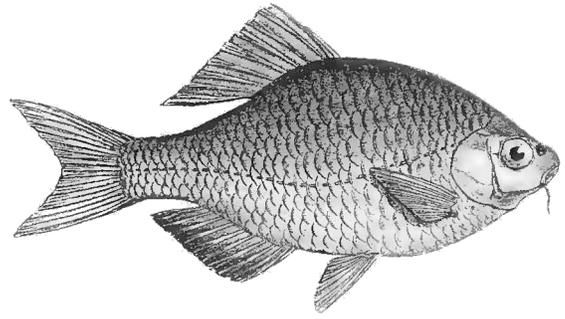
***Tanakia koreensis* (Kim & Kim 1990)** *-ensis*, Latin suffix denoting place: South Korea, where it is endemic

***Tanakia lanceolata* (Temminck & Schlegel 1846)** Latin for lance-like, presumably referring to its more lanceolate (leaf-like) shape compared with other Japanese bitterlings

***Tanakia latimarginata* Kim, Jeon & Suk 2014** *latus* (L.), wide or broad; *marginata* (L.), bordered or margined, referring to broad black border on anal fin of mature males

***Tanakia limbata* (Temminck & Schlegel 1846)** Latin for edged or bordered, presumably referring to blackish edges on dorsal and anal fins

***Tanakia shimazui* (Tanaka 1908)** in honor of “Mr. Shimazu” (forename not given), a naturalist in Kyoto, Japan, who collected holotype



*Tanakia limbata*. From: Temminck, C. J. and H. Schlegel. 1846. Pisces. In: Siebold, P. F. de (ed.). Fauna Japonica. Lugduni Batavorum [Leiden] (A. Arnz et soc.). Parts 10–14: 173–269.

***Tanakia signifer* (Berg 1907)** *signum* (L.), mark; *-fer*, from *fero* (L.), to have or bear, probably referring to broad whitish band on dorsal-fin margin

***Tanakia somjinensis* (Kim & Kim 1991)** *-ensis*, Latin suffix denoting place: Somjin River, South Korea, type locality