

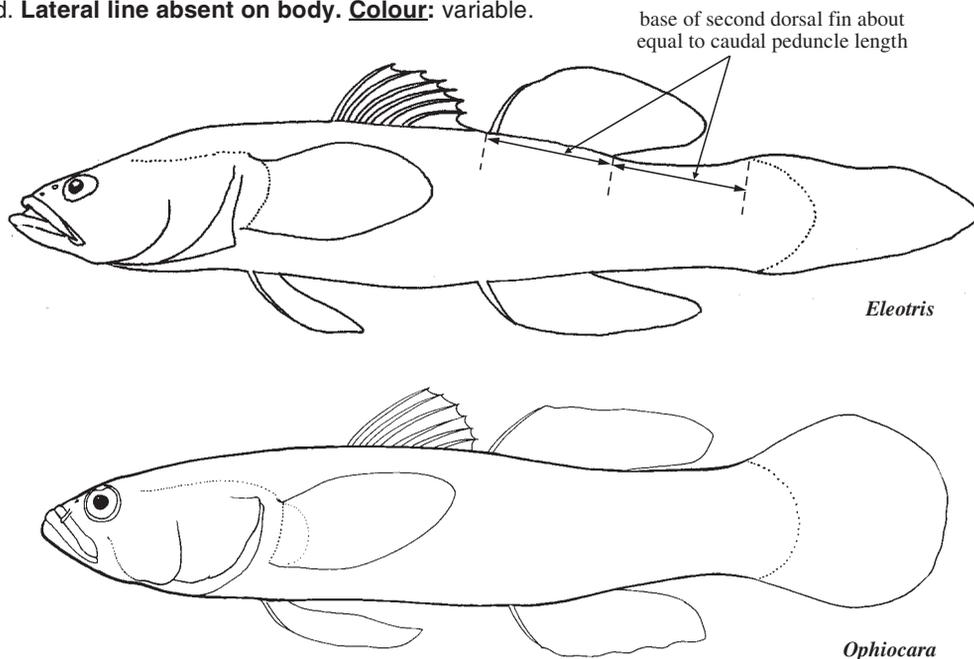
Suborder GOBIOIDEI

ELEOTRIDAE

Sleepers (gudgeons)

by H.K. Larson and E.O. Murdy

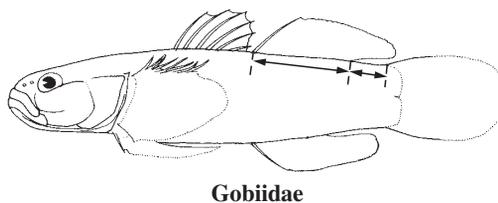
Diagnostic characters: Small to moderate gobioid fishes (to about 60 cm, usually to 20 cm); body typically stout. **Head** short and broad, usually scaly; **typically with a series of sensory canals and pores, and cutaneous papillae**. Snout blunt. Teeth usually small, sharp, and conical, in several rows in jaws. Branchiostegal rays 6. Gill membranes broadly joined to isthmus. **Two separate dorsal fins**, the first with VI to X flexible spines, the second with I flexible spine and 6 to 15 soft rays; origin of anal fin just posterior to a vertical with origin of second dorsal fin; anal fin with I weak spine and 6 to 12 soft rays (terminal ray of second dorsal fin and anal fin divided to its base, but only counted as a single element); pectoral fins broad, with 14 to 25 rays; **pelvic fins always separate**, long, with I spine and 5 soft rays; caudal fins broad and rounded, with 15 to 17 segmented rays. Scales small to large, either cycloid or tenoid. **Lateral line absent on body**. **Colour:** variable.



Habitat, biology, and fisheries: Sleepers occur in fresh or brackish waters, although some species are truly marine. One genus (*Calumia*) is found on coral reefs. They are bottom-dwelling fishes and most species are carnivorous. Many are relatively inactive, hence the common name of 'sleeper'. The family, found in all subtropical and tropical waters (except the Mediterranean and its tributaries), comprises approximately 40 genera and 150 species; 15 genera and 28 species are recorded from the Western Central Pacific. Although most sleepers are small sized, species of *Oxyeleotris* from this area may reach 60 cm. The 'marbled goby' (*Oxyeleotris marmoratus*) is highly esteemed as food in Thailand, Malaysia, and Singapore, and is cultured in cages. Other species of *Oxyeleotris*, and estuarine species such as *Pogoneleotris heterolepis*, may also be sought after by artisanal fishers.

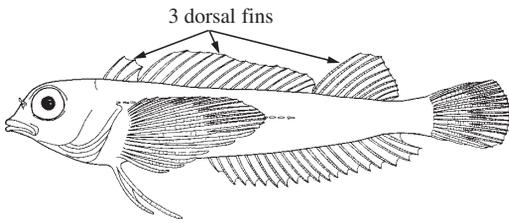
Similar families occurring in the area

Gobiidae: base of second dorsal usually longer than distance from end of second dorsal fin to base of caudal fin; pelvic fins connected to form a disc in species from brackish and fresh water, fins separated in some species living on or around coral reefs.

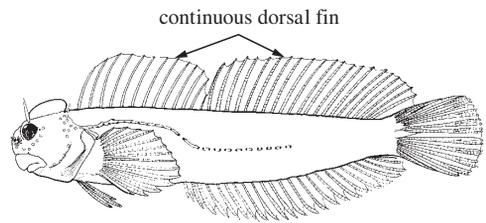


Tripterygiidae: 3 separate dorsal fins, 2 of them with flexible spines and 1 with soft rays.

Blenniidae: body without scales; dorsal fin continuous, with fewer than XX flexible spines and 12 or more soft rays; cirri may be present above eyes and on nape.



Tripterygiidae



Blenniidae

Key to the marine and estuarine genera occurring in the area

[modified and revised from Hoese in Smith and Heemstra (1986), Kottelat et al. (1993), and Larson (unpubl.)]

- 1a. Scales on body small and cycloid, typically 90 or more scales in a lateral series → 2
- 1b. Scales on body ctenoid, at least posteriorly, scales moderate to large, typically fewer than 100 in a lateral series → 3

- 2a. Vomerine teeth present (estuaries, mangroves) *Bostrychus*
- 2b. No teeth on vomer (estuarine to fresh water) *Odonteleotris*

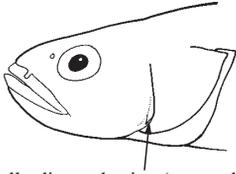
- 3a. Rear of preopercle with a ventrally-directed spine (covered by skin) (Fig. 1); predorsal scales 35 to 53 (estuarine to fresh water) *Eleotris*
- 3b. Preopercle without spine; predorsal scales in fewer than 30 rows. → 4

- 4a. Bony irregular ridge or row of spiny serrations above eye and on top of snout (spines may be indistinct) (Fig. 2). → 5
- 4b. No bony irregular to spiny ridge above eye or top of snout → 6

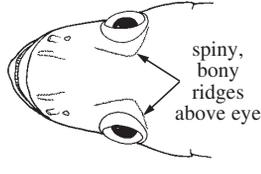
- 5a. Lower jaw distinctly anteriormost, chin protruding; head without fleshy knobs or barbels on chin; distinct black spot on pectoral-fin base or on bases of pectoral-fin rays (marine to estuarine) *Butis*
- 5b. Lower jaw about equal to upper jaw, chin not protruding; chin (and side of head in 1 species) with small to elongate fleshy barbels; pectoral-fin base and bases of pectoral-fin rays dusky or mottled, but without distinct black spot (marine to estuarine) *Prionobutis*

- 6a. Side and underside of head with rows of elongate papillae, including groups of branched barbels; eye greatly reduced; ctenoid body scales with auxiliary cycloid scales (estuarine) *Pogoneleotris*
- 6b. Head without elongate papillae or branched barbels, if barbels under head present then eye not greatly reduced in size and body scales without cycloid auxiliary scales → 7

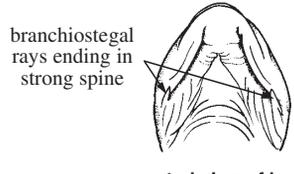
- 7a. Head scaleless; first (or first and second) branchiostegal rays with anteriorly-directed spine (Fig. 3); sensory papillae on head in longitudinal pattern (estuarine to fresh water) ***Belobranchus***
- 7b. Head partly or totally scaled; if spine present on first or second branchiostegal ray, then sensory papillae on head in transverse pattern → 8



ventrally directed spine (covered by skin)
Fig. 1 *Eleotris*



dorsal view of head
Fig. 2 *Butis*



ventral view of head
Fig. 3 *Belobranchus*
(after Koumans, 1953)

- 8a. Predorsal scales 10 or fewer; small coral reef-dwelling fish (marine) ***Calumia***
- 8b. Predorsal scales 10 or more; brackish to fresh-water dwelling fish → 9
- 9a. Head and body usually compressed; body short (less than 6 cm total length); 26 to 28 scales in a lateral series (estuarine to fresh water). ***Hypseleotris***
- 9b. Body cylindrical, at least anteriorly; usually more than 28 scales in a lateral series → 10

- 10a. Sensory papillae on head arranged in transverse pattern (Fig. 4a) → 11
- 10b. Sensory papillae on head arranged in longitudinal pattern (Fig. 4b) → 13

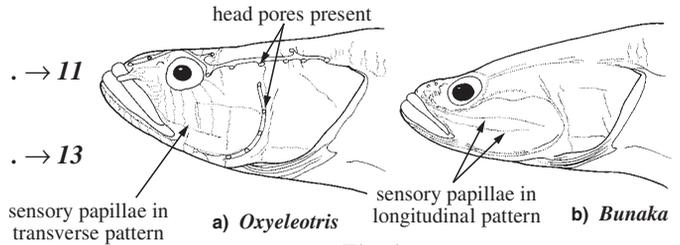


Fig. 4
(after Wongrat, unpubl.)

- 11a. Scales in lateral series about 60 to 100; pectoral-fin rays 17 to 19; head may be somewhat depressed, body cylindrical; size usually greater than 10 cm standard length when adult (estuarine to fresh water) ***Oxyeleotris***
- 11b. Scales in lateral series about 55 or fewer; pectoral-fin rays 13 to 15 → 12

- 12a. Scales in lateral series about 45 to 55; when live, body grey with several indistinct whitish saddles across back; size usually less than 6 cm standard length when adult (estuarine, mangroves) ***Incara***

- 12b. Usually 33 to 42 scales in a lateral series; body brown with 2 or 3 wedge-shaped whitish to yellowish bars across back (most pronounced in juveniles), when live, body with pale golden speckles; adults reaching up to 25 cm standard length (estuarine) ***Ophiocara***

- 13a. Head pores absent; scales in lateral series about 50 to 60; colouring brown with fine narrow dark lines along side of body (following scale rows), head lighter brown with dark and light blotches and mottling on side of head and lips (estuarine) ***Bunaka***

- 13b. Head pores present (may be very small); scale number and colouring variable → 14

- 14a.** Vomerine teeth present; interorbital narrow, width about equal to eye diameter; body usually with 1 or more dark brown lateral stripes, but without orange, blue, and yellow spots and other markings (fresh water) *Gobiomorphus*
- 14b.** Vomerine teeth absent; interorbital wide, width greater than eye diameter; body often with a single dark lateral stripe and irregular black double blotch present on pectoral-fin base; when live, body with orange, blue, and yellow markings (estuarine to fresh water) *Ophieleotris*

List of marine and brackish-water species occurring in the area

- Belobranchius belobranchius* (Valenciennes, 1837)
- Bostrychus sinensis* Lacepède, 1801
- Bostrychus zonatus* Weber, 1908
- Bunaka gyrinoides* (Bleeker, 1853)
- Butis amboinensis* (Bleeker, 1853)
- Butis butis* Hamilton, 1822
- Butis gymnopus* (Bleeker, 1854)
- Butis humeralis* (Valenciennes, 1837)
- Butis koilomatodon* (Bleeker, 1849)
- Calumia godeffroyi* (Günther, 1877)
- Calumia profunda* Larson and Hoese, 1980
- Eleotris acanthopoma* (Bleeker, 1853)
- Eleotris fusca* (Bloch and Schneider, 1801)
- Eleotris melanosoma* Bleeker, 1852
- Gobiomorphus australis* (Krefft, 1864)
- Gobiomorphus coxii* (Krefft, 1864)
- Hypseleotris compressa* (Krefft, 1864)
- Hypseleotris cyprinoides* (Valenciennes, 1837)
- Incara multisquamata* Rao, 1971
- Odonteleotris macrodon* (Bleeker, 1853)
- Ophieleotris margaritacea* (Valenciennes, 1837)
- Ophiocara porocephala* (Valenciennes, 1837)
- Oxyeleotris marmorata* (Bleeker, 1852)
- Oxyeleotris urophthalmoides* (Bleeker, 1853)
- Oxyeleotris urophthalmus* (Bleeker, 1851)
- Pogoneleotris heterolepis* (Günther, 1869)
- Prionobutis dasyrhynchus* (Günther, 1868)
- Prionobutis microps* (Weber, 1908)

References

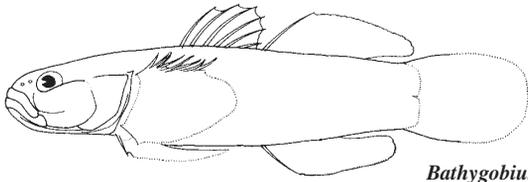
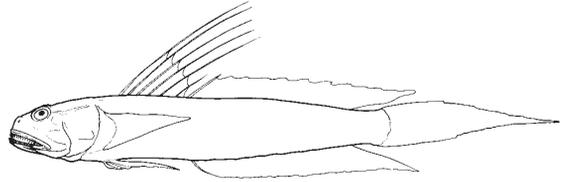
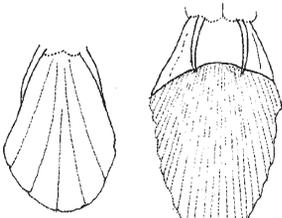
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- Koumang, F.P. 1953. Gobioidae. In *The fishes of the Indo-Australian Archipelago, Vol. 10*, edited by M. Weber and L.F. de Beaufort. Leiden, Brill, 423 p.

GOBIIDAE

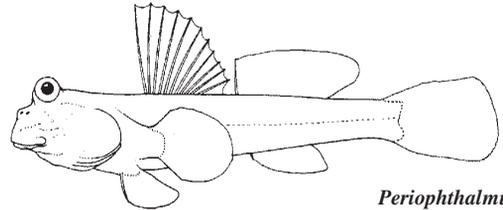
Gobies

by H.K. Larson and E.O. Murdy

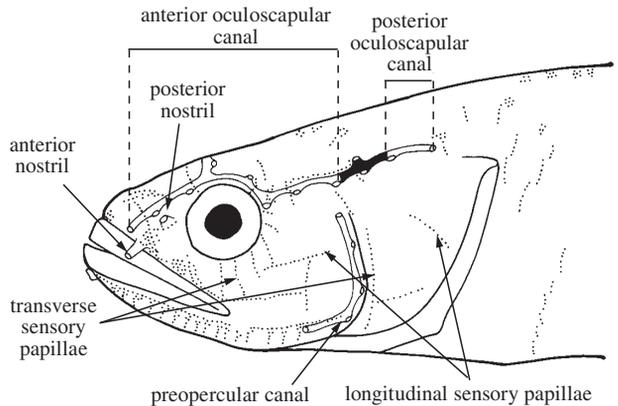
Diagnostic characters: Small gobioid fishes (to 30 cm, usually less than 10 cm); body typically stout (but with many exceptions). **Head** short and broad, often scaly, **typically with a series of sensory canals and pores, and cutaneous papillae**. Snout rounded. Teeth usually small, sharp, and conical, in 1 to several rows in jaws. Gill membranes broadly joined to isthmus. **Two separate dorsal fins**, the first with V to X weak spines, the second with I weak spine and 5 to 37 soft rays; anal fin with I weak spine and 5 to 36 soft rays (typically terminal ray of second dorsal and anal fins divided to its base, but only counted as a single element); pectoral fins broad with 12 to 25 rays; pelvic fins long with I spine and 5 soft rays, pelvic-fin spines usually joined by fleshy membrane (frenum), and **innermost pelvic-fin rays usually joined by membrane, forming a disk** (gobies with pelvic fins not united typically found in coral-reef areas); caudal fin broad and rounded, with 16 or 17 segmented rays. Scales large, either cycloid or ctenoid. **Lateral line absent on body. Colour:** variable.

*Bathygobius**Oxyurichthys*

pelvic fins united

*Periophthalmus*

Habitat, biology, and fisheries: The Gobiidae is the largest family of marine fishes and comprises more than 220 genera and 1 500 species. In the Western Central Pacific, gobies are represented by about 100 genera and approximately 500 species. They are usually secretive in their habits and typically very small (*Trimmatom nanus*, one of the smallest known vertebrates, matures at 8 mm). This highly successful family primarily inhabits shallow tropical and subtropical waters but has invaded nearly all benthic habitats from fresh water to the shoreline to depths exceeding 500 m. Gobiid fishes dwell on a variety of substrata from mud to rubble, and coral reefs are particularly rich in goby species. Some gobies spend their entire lives in fresh waters, others migrate back and forth between fresh water and brackish water environments, or between marine and brackish waters. Members of the subfamily Sicydiinae inhabit the upper reaches of rivers, often at great altitudes, and migrate downstream to spawn; when spawning is complete, the fertilized eggs drift out with currents to develop at sea, and the adults return to their upstream habitat, often overcoming torrential stream flows. Some gobies associate with other organisms such as shrimps, sponges, soft corals, and other fishes. For a few species, symbiotic relationships with other organisms are a necessary part of the goby's lifestyle. For instance, the cleaner gobies of the Caribbean (*Elacatinus*) feed on ectoparasites of other fishes whereas the Indo-Pacific gobies of the genera *Amblyeleotris* and *Cryptocentrus* share a burrow with a snapping shrimp (*Alpheus*). Typically, female gobies lay a small mass of eggs, each attached by an adhesive stalk to the underside of



sensory papillae and canal pores in a gobioid fish

(after Masuda et al., 1984)

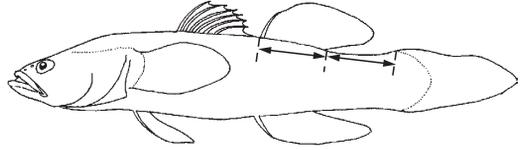
Typically, female gobies lay a small mass of eggs, each attached by an adhesive stalk to the underside of

dead shells or other firm overhanging substrate. The eggs are guarded and tended by the male. Most gobiids are of no commercial or recreational importance other than as food for larger fishes. However, postlarval fry of *Awaous* and species of Sicydiinae are popular food items to native peoples throughout the area. Fry are collected in nets as they enter river and stream mouths during migrations from the sea to fresh water, usually during a full moon.

Remarks: The keys to subfamilies and genera are modified and revised from Hoese in Smith and Heemstra (1986), Myers (1989), Murdy (1989), Larson (1990), Kottelat et al. (1993), Shibukawa and Murdy (unpubl.), and Larson (unpubl.).

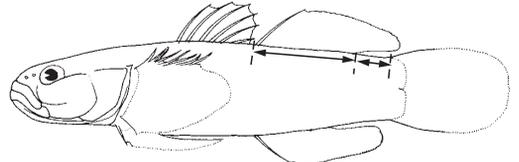
Similar families occurring in the area

Eleotridae: base of second dorsal fin equal to or shorter than distance from end of second dorsal fin to base of caudal fin; pelvic fins always separate; found mostly in brackish or fresh-water habitats, only 1 species occurs on coral reefs.



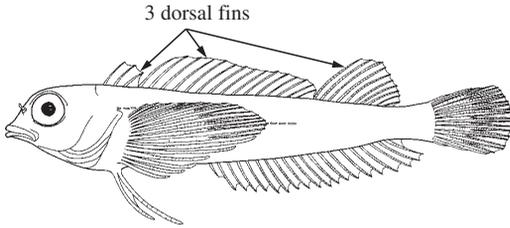
Eleotridae

Tripterygiidae: 3 separate dorsal fins present, 2 of them with flexible spines and 1 fin with soft rays; cirri may be present on eye.

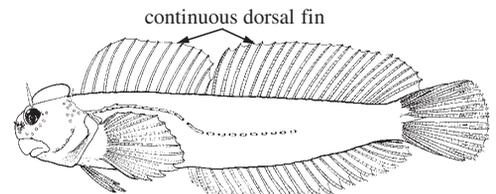


Gobiidae

Blenniidae: body without scales; dorsal fin continuous, with fewer than XX flexible spines and 12 or more soft rays; cirri may be present on eye and on nape.



Tripterygiidae



no scales

Blenniidae

Keys to the subfamilies of Gobiidae occurring in the area

1a. Dorsal and anal fins connected to caudal fin, both dorsal fins united by membrane; mud-burrowing, elongate gobies with pink to purple skin (Fig. 1). **Amblyopinae**

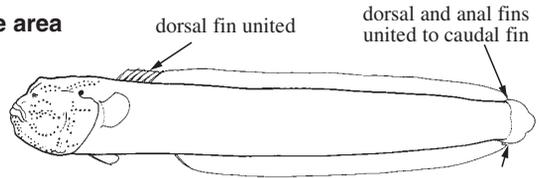


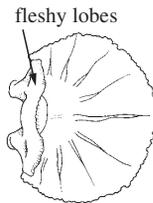
Fig. 1 Amblyopinae
(after Koumans, 1953)

1b. Dorsal and anal fins separated from caudal fin, both dorsal fins typically separate. → 2

2a. Lower jaw typically possessing only a single row of teeth. → 3

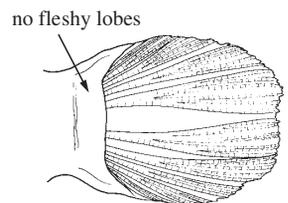
2b. Lower jaw typically possessing more than 1 row of teeth. → 4

3a. Pelvic frenum with fleshy lobes over spines (Fig. 2a); eyes lateral. **Sicydiinae**



a) Sicydiinae

3b. Pelvic frenum without fleshy lobes (Fig. 2b); body elongate; eyes located mostly dorsally. **Oxudercinae**

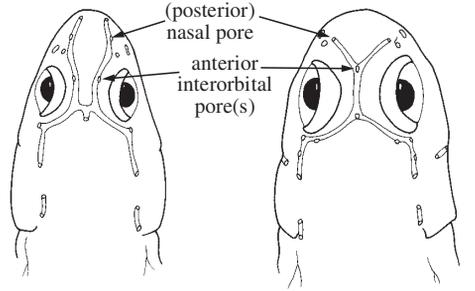


b) Oxudercinae

Fig. 2 ventral view of pelvic fins

4a. Paired anterior interorbital pores present or head pores completely lacking (Fig. 3a); pelvic frenal simple, not folded forward, frenal without fleshy lobes around pelvic-fin spines; if head pores absent, then 1 or more of the following conditions also exist: 1) pelvic frenal present, 2) body fully scaly or mostly scaly, and/or 3) no barbels present on chin [except for 1 genus, *Gnatholepis*, only non-coral reef gobies are included here, *Gnatholepis* possesses head pores] **Gobionellinae** (sensu Pezold, 1993)

4b. Usually a single anterior interorbital pore present or head pores completely lacking (Fig. 3b); if 2 anterior interorbital pores present, then pelvic frenal folded forward and a fleshy lobe present around each spine; if head pores absent, then 1 or more of the following conditions also exist: 1) pelvic frenal absent, 2) body naked or with a few scales on caudal peduncle, and/or 3) barbels present on chin [although exceptions exist, head pores are typically absent only in a few small coral-reef gobies] **Gobiinae** (sensu Pezold, 1993)



a) **Gobionellinae** (*Stenogobius psilosinonius*) b) **Gobiinae** (*Acentrogobius nebulosus*)

Fig. 3 dorsal view of head

Key to the genera of Amblyopinae occurring in the area

(from Shibukawa and Murdy, unpubl.)

Note: there are several known species that do not belong to any described genus; these are not included in the key (see species list).

1a. Pelvic fins moderate to large, pelvic-fin length 64% or more of head length (typically greater than 70%); pelvic fins always fully united and forming a disc (**Taenioides Group**) → 2

1b. Pelvic fins small to moderate, pelvic-fin length 62% or less of head length, (typically less than 40%); pelvic fins fully united forming a disc (*Caragobius* and *Trypauchen*), or emarginate posteriorly (*Amblyotrypauchen* and *Ctenotrypauchen*), or completely separate (*Trypauchenichthys*) (**Trypauchen Group**) → 5

2a. Head and body with distinct cutaneous ridges; upper lip thick, fleshy, with fringed dorsal margin; caudal fin short, the length usually subequal to head length; ventral surface of lower jaw usually with several clusters of long, fleshy barbels; head and body entirely naked **Taenioides**

2b. Head without distinct cutaneous ridges; upper lip thick or thin, not fringed dorsally; caudal fin long or very long, the length usually greater than head length (excluding *Brachyamblyopus*); head with or without barbels; minute cycloid scales at least on posterior part of body (sometimes difficult to discern without magnification) → 3

3a. Most pectoral-fin rays branched, not forming free rays; pectoral-fin rays 23 or fewer **Brachyamblyopus**

3b. Most pectoral-fin rays simple, free from fin membrane; pectoral-fin rays 20 to 65, usually more than 23 → 4

4a. Head and body subcylindrical (slightly compressed posteriorly), greatly elongate, body depth less than 10% of standard length; teeth on outermost row of jaws enlarged, fang-like (Fig. 4); a pair of symphyssial canines on lower jaw; scales minute, typically smaller than eye diameter (except for those on posterior half of body) **Odontamblyopus**

4b. Head and body compressed, moderately short, body depth 14.1 to 16% of standard length; teeth of outermost row of jaws close-set, flattened, not fang-like; no symphyssial canine teeth on lower jaw; scales large, distinctly larger than eye diameter **Pseudotrypauchen**

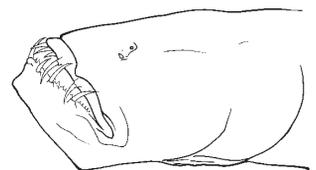


Fig. 4 *Odontamblyopus rubicundus*

pouch-like cavity on head

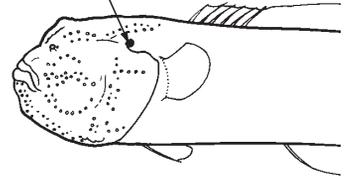


Fig. 5

- 5a. A pouch-like cavity at dorsal margin of operculum present (Fig. 5); pectoral fins emarginate, asymmetrical dorsoventrally, with large upper lobe; pore-like posterior nostril enlarged, distinctly greater than eye; frontal crest well developed, prominent in external view, sometimes with serrated dorsal margin (sometimes invisible in external view); segmented caudal-fin rays 9+8 (i.e., 9 in upper portion and 8 in lower portion of fin), including 8+7 branched rays → 6
- 5b. No pouch-like cavity at dorsal margin of operculum; pectoral fins rounded, symmetrical dorsoventrally; pore-like posterior nostril subequal to eye diameter; dorsal margin of frontal crest usually visible externally, but not prominent; segmented caudal-fin rays usually 7+6, including 6+5 branched rays *Caragobius*
- 6a. Fang-like teeth on jaws; some scale patches on head *Amblyotrypauchen*
- 6b. No fang-like teeth on jaws (teeth on outer row sometimes strongly caninoid); head typically naked → 7
- 7a. Pelvic fins separated to base; pelvic fins with I spine and 3 soft rays; frontal crest prominent with distinct serrated dorsal margin and horn-like projection directed anteriorly (at least in adults) *Trypauchenichthys*
- 7b. Pelvic fins united medially (sometimes emarginate posteriorly); pelvic fins with I spine and 5 soft rays; frontal crest prominent, sometimes with weak serration along dorsal margin, but not projecting anteriorly → 8
- 8a. Belly fully scaled (sometimes with narrow naked area along ventral midline), typically not possessing ventral keel; pelvic fins united and rounded posteriorly, typically forming funnel-like disc *Trypauchen*
- 8b. Belly naked, with prominent ventral keel; pelvic fins connected medially, but emarginate posteriorly, not forming a disc *Ctenotrypauchen*

Key to the described genera of Gobiinae occurring in the area

Note: many genera remain to be adequately revised or defined; consequently the key is not guaranteed to work for all species of a genus. Some genera will key out in more than one place in the key. There are several known species which do not belong to any described genus; these are not included in the key.

- 1a. First gill slit closed by membrane (Fig. 6); distinctive transverse papillae pattern on head (Fig. 7) (coral reefs) . . . *Heteroleotris*

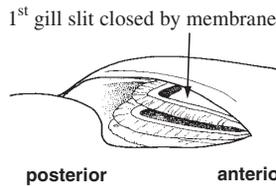


Fig. 6 ventral view of gill opening

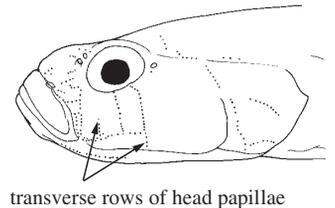


Fig. 7 *Heteroleotris zonatus*

- 1b. First gill slit open; papillae pattern longitudinal or transverse → 2
- 2a. Body naked or with a few scales on caudal peduncle → 3
- 2b. Body scaled at least on posterior half → 8
- 3a. Pelvic fins separate and slender → 4
- 3b. Pelvic fins united → 5

[note: need to cut gill membrane at isthmus and open wide to see this feature]

- 4a. Body deep and robust, eyes small (Fig. 8) (coral reefs) *Austrolethops*
- 4b. Body slender, eyes moderate to large (coral reefs) *Trimmatom* (in part)
- 5a. Teeth tricuspid; body slender (rocky shores) *Kelloggella*
- 5b. Teeth pointed → 6

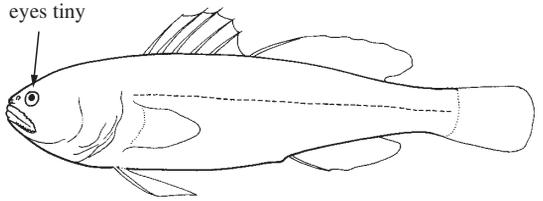


Fig. 8 *Austrolethops wardi*
(after Hoese, 1986)

- 6a. Body elongate; anal fin with 13 elements, including spine (sandy shores) *Parkraemeria*
- 6b. Body short and/or compressed; anal fin with 10 or fewer elements, including spine → 7
- 7a. Head and body deep and compressed; body and fins with thick mucus coat; pelvic fins short and fleshy (coral reefs) *Gobiodon*
- 7b. Body short and robust, compressed posteriorly but head usually rounded; mucus coat not greatly developed; pelvic fins not fleshy (deep water) *Lubricogobius*
- 8a. Thin dermal crest on top of head anterior to first dorsal fin → 9
- 8b. No dermal crest anterior to first dorsal fin → 11

- 9a. Sensory papillae on head transverse; body relatively plain dark brown, with dark blotch on shoulder just above pectoral-fin base (estuaries) *Lophogobius* (in part)
- 9b. Sensory papillae on head longitudinal; colour pattern variable, often with small dark spots → 10

- 10a. Dermal crest low, less than pupil diameter (Fig. 9a); body elongate; second dorsal fin and anal fin with I spine and 12 soft rays (estuaries, shallow reefs). *Cryptocentroides*
- 10b. Dermal crest high, more than pupil diameter (Fig. 9b); body deep; second dorsal fin and anal fin with I spine and 9 soft rays (estuaries). *Cristatogobius*

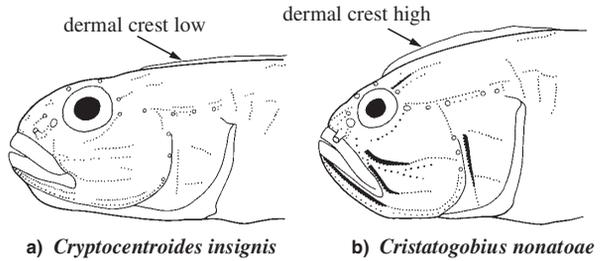


Fig. 9
(after Akihito et al., 1988)

- 11a. Barbels present on ventral surface of head (may be on chin only), barbels distinctly larger than any elongate papillae (Fig. 10) → 12
- 11b. Papillae on underside of head may be elongate, but no barbels present → 16
- 12a. Large black spot present dorsally on caudal fin; cheek and opercle covered with scales (deep water) *Parachaeturichthys*
- 12b. No large black spot on caudal fin; no scales on cheek or opercle → 13

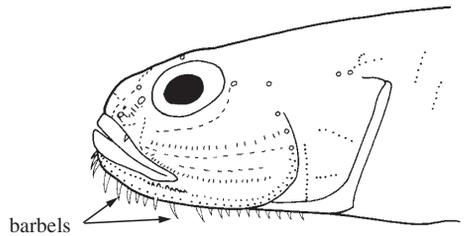


Fig. 10 *Parachaeturichthys polynema*
(after Akihito et al., 1988)

- 13a. One or 2 distinct folds on cheek (Fig. 11); head pores present or absent; barbels in several pairs or small groups → 15
- 13b. No folds on cheek; head pores always present, including 1 or 2 over opercle; barbels profuse or 1 pair only → 14
- 14a. Barbels on head profuse, slender, forming fringe around head (Fig. 12) (coral reefs) . *Barbuligobius*
- 14b. Barbels reduced to small pair on chin (fresh water to estuaries) *Glossogobius* (in part)

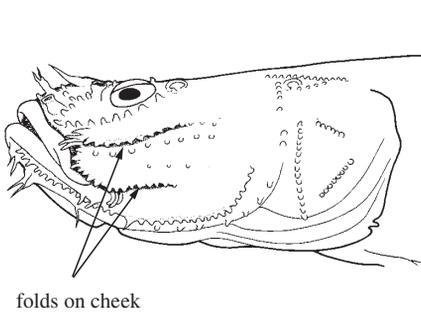


Fig. 11 *Gobiopsis malekulae*
(after Lachner and McKinney, 1978)

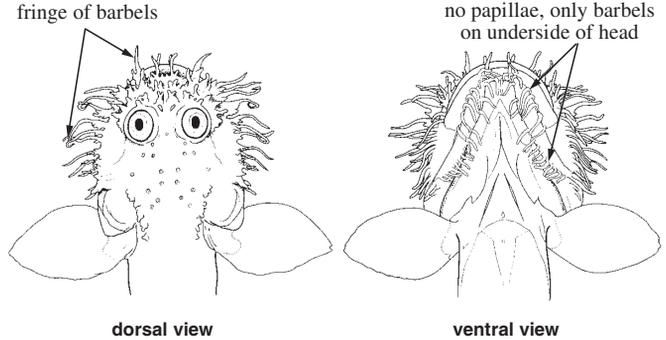


Fig. 12 *Barbuligobius boehlkei*
(after Lachner and McKinney, 1974)

- 15a. Barbels only present on chin (Fig. 13); entire fish greatly dorsoventrally flattened and elongate (deep reefs) *Platygobiopsis*
- 15b. Barbels may be present on chin, snout and sides of head (Fig. 14); fish stout, with depressed head but body never extraordinarily elongate (coral reefs, estuaries) . . . *Gobiopsis*

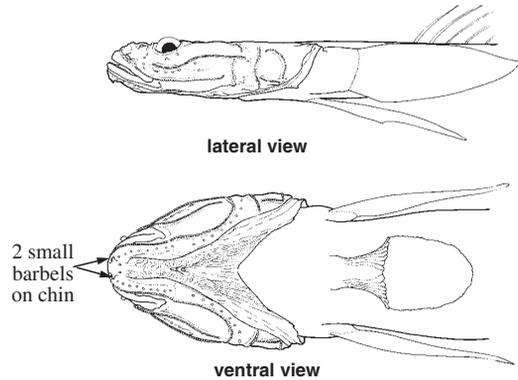


Fig. 13 *Platygobiopsis akihito*
(after Springer, 1992)

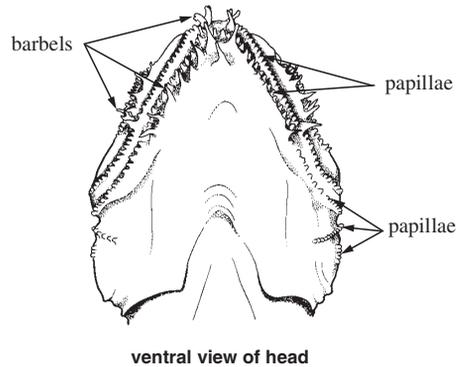


Fig. 14 *Gobiopsis*
(after Lachner and McKinney, 1978)

- 16a. First spine in first and second dorsal fins rigid and pungent, and usually thickened → 17
- 16b. Dorsal-fin spines thin and flexible, not pungent or thickened → 21
- 17a. Preopercle with 1 to 3 flat spines; nape may have small scales (coral reefs) *Oplopomus*
- 17b. Preopercle without spines; nape scales may be as large as body scales (or absent) → 18
- 18a. Nape, preopercle and opercle naked; first spine of first and second dorsal fins not much thicker than remaining spines; all scales cycloid (coral reefs) *Echinogobius*
- 18b. Nape scaled, at least opercle partly scaled, preopercle may or may not be scaled; first spines of first and second dorsal fins twice the thickness of remaining fin spines; body scales ctenoid → 19
- 19a. Preopercle and opercle fully scaled (deep water) *Hazeus*
- 19b. Preopercle naked, opercle partly scaled → 20

- 20a. Opercle naked below level of upper pectoral-fin base (sand, coral reefs) *Oplopomops*
- 20b. Opercle scaled at least to level of upper one-third of pectoral-fin base (shallow reefs) *Opua*

- 21a. Preopercle with a single large prominent spine (shallow reefs) *Gladiogobius*
- 21b. Preopercle with 0 to 9 small spines → 22

- 22a. Preopercle with 1 to 9 spines (coral reefs) *Asterropteryx*
- 22b. No spines on preopercle → 23

- 23a. First dorsal fin elongate, fin origin at rear of head opposite rear end of opercle (coral reefs) *Discordipinna*
- 23b. First dorsal fin variable in shape, fin origin behind pectoral-fin base → 24

- 24a. Cheeks with papillae in transverse pattern, papillae prominent, raised upon fleshy flaps (Fig. 15) (coral reefs, estuaries) *Callogobius*
- 24b. Cheeks with papillae in transverse or longitudinal pattern but without prominent vertical fleshy flaps bearing papillae → 25

- 25a. Pelvic fins with thickened lobe around each pelvic-fin spine, frenum folded forward forming a pocket (Fig. 16) → 26
- 25b. Pelvic fins with or without thickened skin around each pelvic-fin spine, frenum flat, may be fleshy but not folded forward → 30

- 26a. Interorbital canals separate, 2 anterior interorbital pores present (Fig. 17a) → 28
- 26b. Interorbital canal single, 1 (rarely 2) anterior interorbital pore present (Fig. 17b) → 27

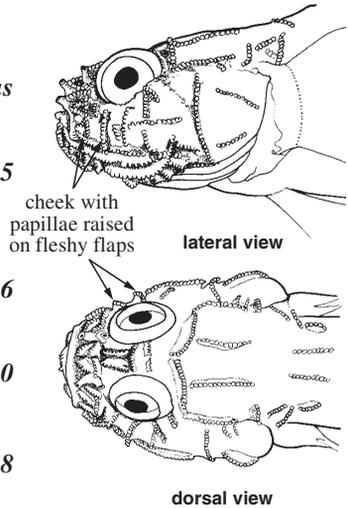
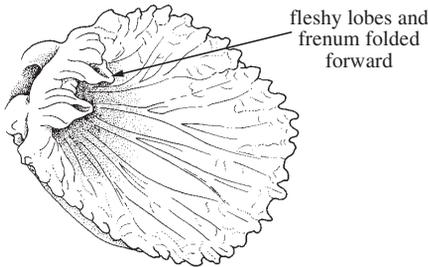
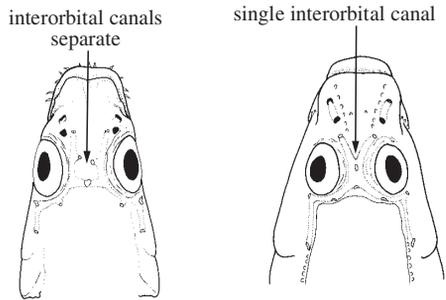


Fig. 15 *Callogobius crassus*
(after McKinney and Lachner, 1984)



ventral view of pelvic fins

Fig. 16 *Bryaninops*
(after Larson, 1985)



a) *Bryaninops yongei* b) *Pleurosicya boldinghi*

Fig. 17 dorsal view of head
(after Larson and Hoese, 1980)

- 27a. Edge of lower lip fused to underside of head, lip free at chin only (coral reefs) *Luposicya*
- 27b. Edge of lower lip free at sides, fused at chin (coral reefs) *Pleurosicya*

- 28a. Pectoral rays all branched; eyes small (deep water) *Lobulogobius*
- 28b. Pectoral fins with lower 2 to 6 rays unbranched and tips usually thickened; eyes large → 29

- 29a. Gill opening wide and not attached to isthmus; head broad and flattened; nape scaled (coral reefs) *Phyllogobius*
- 29b. Gill opening wide or narrow, but always attached to isthmus; head not flattened but may be elongate; nape usually naked (coral reefs) *Bryaninops*
- 30a. Chin with curved mental frenum (free fleshy flap; Fig. 18) or distinct rounded to triangular knob → 31
- 30b. Chin relatively smooth, without a mental frenum, may be slight swelling on chin just anterior to row of sensory papillae → 34
- 31a. Tips of upper pectoral-fin rays free and silk-like and no curved canine tooth in each side of lower jaw (usually shallow reefs) *Bathygobius*
- 31b. Tips of upper pectoral-fin rays not free or if free, then a curved canine tooth present at each side of lower jaw → 32
- 32a. Mouth subterminal with snout partly overhanging upper lip; second dorsal fin with I spine and 10 or 11 soft rays, anal fin with I spine and 9 or 10 soft rays (coral reefs, estuaries) *Istigobius* (in part)
- 32b. Mouth terminal; second dorsal fin with I spine and 7 to 9 soft rays, anal fin with I spine and 6 to 9 soft rays → 33
- 33a. Head depressed; tongue bilobed or deeply concave; pelvic frenum reduced or absent; coloration usually white to yellowish with few dark markings (coral reefs, sand) *Cabillus*
- 33b. Head not depressed; tongue blunt to rounded; pelvic frenum always present, conspicuous; coloration usually mottled, spotted, and barred with brown (coral to rocky reefs) *Palutrus*
- 34a. Head rounded, the ventral surface scattered with numerous small bumps, sides and top of head covered with fleshy bumps or fine flaps (which may be close together); nape naked (coral reefs) *Paragobiodon*
- 34b. Head without fine fleshy flaps and bumps, nape scaled or naked → 35
- 35a. Head pores absent; size not greater than 50 mm standard length → 36
- 35b. Head pores present → 39
- 36a. Head papillae conspicuous, in rows which may form ridges; head depressed (coral reefs) *Feia*
- 36b. Papillae on head small, not forming ridges; head compressed or cylindrical → 37
- 37a. Pelvic-fin rays all unbranched, or at least fifth ray unbranched (coral reefs) *Trimmatom* (in part)
- 37b. Pelvic-fin rays branched; body scaled → 38
- 38a. Gill opening ends below rear margin of preopercle; head usually broader than deep; vertical bars with dark borders present on head at least (coral reefs, deep water) *Priolepis*
- 38b. Gill opening extends to below eye or at least to preopercular margin; head usually deeper than broad; colour pattern variable, often with spots on head (coral reefs) *Trimma*
- 39a. Pelvic fins completely separate, no membrane connecting bases of fifth pelvic-fin rays (Fig. 19a) → 40
- 39b. Pelvic fins partly or completely connected by membrane (Fig. 19b) → 43
- 40a. Papillae on cheek include short transverse rows; gill opening extends to below preopercle (coral reefs) *Amblyeleotris* (in part)
- 40b. Papillae on cheek in longitudinal pattern → 41

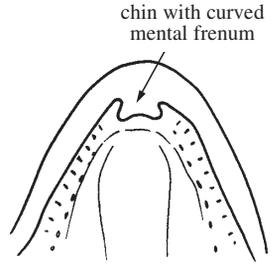


Fig. 18 ventral view of lower jaw

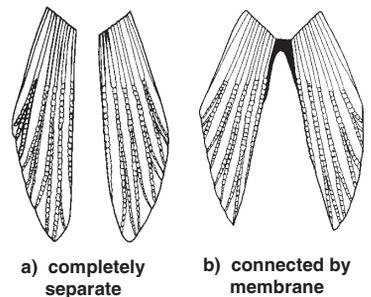


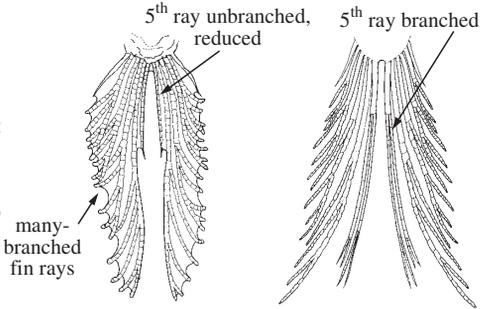
Fig. 19 ventral view of pelvic fins

41a. Teeth in upper jaw in single row; adult size greater than 50 mm standard length (coral reefs) *Valenciennea*

41b. Teeth in upper jaw in 2 or more rows; adult size less than 30 mm standard length → 42

42a. Fifth pelvic-fin ray unbranched, usually considerably reduced, fin rays many-branched, often fringe-like (Fig. 20) (coral reefs) *Eviota*

42b. Fifth pelvic-fin ray branched, fin rays branched at tips, but not fringe-like (coral reefs, deep water) *Sueviota* (in part)

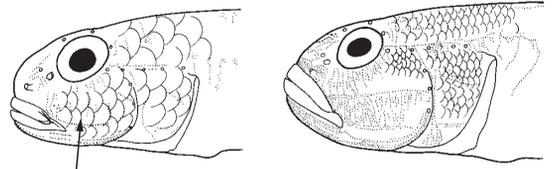


43a. Usually at least 2 rows of papillae on head on raised, fleshy, longitudinal ridges; mouth small, oriented nearly vertically (estuaries) *Mangarinus*

43b. If any papillae rows on head are on raised fleshy ridges, then mouth not small and nearly vertical → 44

44a. Cheeks and operculum covered with scales (may be small or embedded) (Fig 21a) → 45

44b. Cheeks and operculum partially scaled or naked (may be small or embedded) (Fig. 21b) → 48



a) *Macrodontogobius wilburi* b) *Acentrogobius viridipunctatus*
Fig. 21 (after Akihito et al., 1988)

45a. Head pores absent; frenum between pelvic-fin spines absent (deep water). *Egglestonichthys* (in part)

45b. Head pores present; frenum between pelvic-fin spines present → 46

46a. Gill opening restricted to pectoral-fin base or to below opercle; if transverse papillae present under eye, then snout rounded and may overhang upper lip slightly. → 47

46b. Gill opening very wide, extending up to below eye; 7 to 10 short rows of transverse papillae below eye; snout pointed, with lower jaw tip anteriormost; 5 or 6 brown spots along side of body (estuaries, coastal) *Isthmogobius*

47a. Body slender, body depth contained more than 4 times in standard length; prominent recurved canine tooth at angle of lower jaw (coral reefs) *Macrodontogobius*

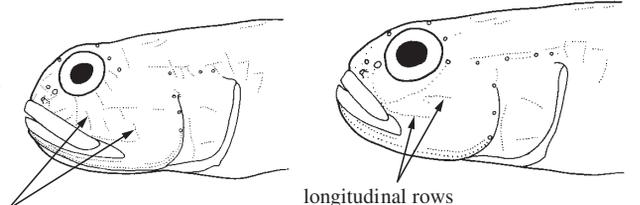
47b. Body deep, body depth contained less than 4 times in standard length; no prominent recurved canine tooth on lower jaw (coral reefs, estuaries) *Exyrias*

48a. Gill opening extending to below rear margin of preopercle (or farther forward) → 49

48b. Gill opening restricted to pectoral-fin base or slightly further forward to below opercle → 63

49a. Head papillae in transverse pattern, at least transverse rows present under eye (Fig. 22a) → 55

49b. Head papillae in longitudinal pattern, some rows may be very short (Fig. 22b) → 50



head papillae in transverse rows a) *Cryptocentrus cinctus* b) *Vanderhorstia ornattissima*
longitudinal rows
Fig. 22 (after Akihito et al., 1988)

- 50a. Anal fin always with 1 or more segmented ray than in second dorsal fin (sandy shores, estuaries) *Silhouettea*
- 50b. Anal and second dorsal fins with equal numbers of rays, or dorsal fin with 1 or more ray than anal fin → 51
- 51a. Iris lappet present in eye; tongue deeply bilobed; gill opening wide (nearly to eye) and free of isthmus (coral reefs, estuaries) *Psammogobius*
- 51b. No iris lappet present; tongue may be concave but not deeply bilobed; gill opening variable → 52
- 52a. Second dorsal fin and anal fin with I spine and 8 to 10 soft rays, most papillae rows on cheek long, not reduced (estuaries, fresh water) *Glossogobius* (in part)
- 52b. Second dorsal fin and anal fin with I spine and 10 to 12 soft rays; some cheek papillae rows short or broken → 53
- 53a. A distinct black ocellus in each dorsal fin (coral reefs) *Signigobius*
- 53b. No distinct black ocellus in each dorsal fin → 54
- 54a. Caudal fin always rounded, shorter than head; body pale with dark spots and bright white spot on pectoral fins (coral reefs) *Ctenogobiops*
- 54b. Caudal fin usually pointed, longer than head; body with bars, spots and/or stripes, no bright white spot on pectoral fins (coral reefs) *Vanderhorstia*
- 55a. Scales small, 44 or more in a lateral series → 56
- 55b. Scales large, 40 or fewer in a lateral series → 57
- 56a. First dorsal fin tall and broad with dark bands and/or spots; body with dark oblique bars (Fig. 23) (estuaries, coral reefs) *Mahidolia*
- 56b. First dorsal fin rounded to triangular, comparatively unpatterned; body with spots and blotches but not dark oblique bands (estuaries, mangroves) *Acentrogobius* (in part)
- 57a. Teeth present on vomer (which is curved into mouth; Fig. 24); body pale with distinct dark markings (coral reefs) *Stonogobiops*
- 57b. No teeth on vomer (note: vomer itself may be curved into mouth); colour variable → 58

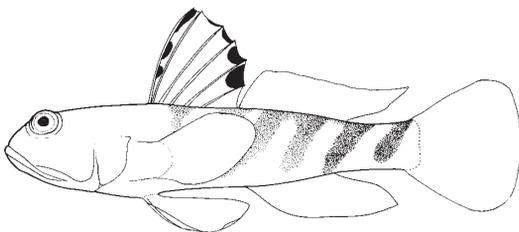


Fig. 23 *Mahidolia mystacina*

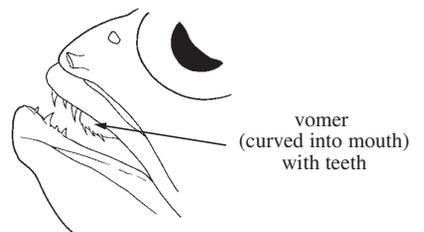


Fig. 24 *Stonogobiops xanthorhinica*

- 58a. Second dorsal fin with I spine and 12 to 14 soft rays; anal fin with I spine and 12 to 14 soft rays (coral reefs) *Amblyeleotris* (in part)
- 58b. Second dorsal fin with I spine and 9 to 11 soft rays; anal fin with I spine and 8 to 10 soft rays → 59
- 59a. Preopercular pores absent; vertical white lines over abdomen present, especially prominent in males (shallow reefs) *Psilogobius* (in part)
- 59b. Preopercular pores present; no vertical white abdominal lines present → 60

- 60a. No posterior oculoscapular canal or pores over top of opercle → 61
- 60b. Posterior oculoscapular canal and 2 pores present over top of opercle → 62

- 61a. First dorsal fin broad and/or tall, longer than or equal to body depth; if body dark, no bright white stripe along nape midline (shallow reefs, estuaries) *Myersina* (in part)
- 61b. First dorsal fin low, with black ocellus; body dark with nape and top of head bright white (coral reefs) *Lotilia*

- 62a. Gill opening wide, membranes forming distinct free fold across isthmus, attaching to isthmus in front of fold (Fig. 25a) (shallow reefs, estuaries) *Myersina* (in part)
- 62b. Gill opening moderately wide, membranes not forming fold across isthmus, but attaching to sides of isthmus (Fig. 25b) (coral reefs, deep water). *Cryptocentrus*

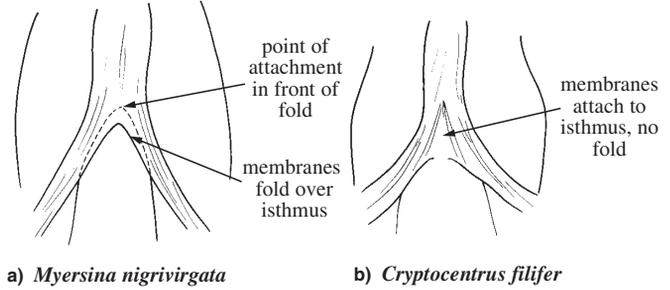


Fig. 25 ventral view of head

- 63a. Papillae on cheek in transverse pattern → 64
- 63b. Papillae on cheek in longitudinal pattern → 68
- 64a. Scales present on cheek, at least behind eye → 65
- 64b. Cheek naked → 66
- 65a. Upper half of cheek covered with scales, nape scales extend forward to snout (deep water) *Egglestonichthys* (in part)
- 65b. Scales on cheek restricted to patch behind eye, nape scales extend up to behind eyes (reefs, estuaries, deep water). *Acentrogobius* (in part)
- 66a. Large posterolaterally-directed canine tooth on lower jaw, often visible when mouth closed; snout rounded and overhangs upper lip in most species (coral reefs) *Amblygobius*
- 66b. No large posterolaterally-directed canine tooth on lower jaw, snout not overhanging upper lip. → 67
- 67a. Nape naked; vertical papillae rows on midcheek do not extend ventrally past lowermost longitudinal cheek row (estuaries) *Lophogobius* (in part)
- 67b. Nape usually with scales, midline may be naked; 1 vertical papilla row on midcheek extends ventrally past lowermost longitudinal cheek row (shallow reefs, estuaries) *Drombus*
- 68a. Cheek (and opercle) with scales; caudal fin long and slender (deep water) *Obliquogobius*
- 68b. Cheek naked, opercle scaled or naked → 69
- 69a. Cheeks swollen; mouth large, extends at least to rear edge of eye (may extend well past eye); gill opening restricted to pectoral-fin base (coral reefs) *Tomiyamichthys*
- 69b. Cheeks not swollen; mouth reaches to below eye; gill opening to under opercle or to rear of eye → 70

- 70a. No oculoscapular canal over opercle, preopercle with only 2 or no pores (coral reefs, deep water) *Sueviota* (in part)
- 70b. Oculoscapular canal present over opercle and preopercle with 3 pores → 71

- 71a. Pore behind eye long and slit-like (Fig. 26) (estuaries, deep water) *Aulopareia*
- 71b. Pore behind eye rounded → 72

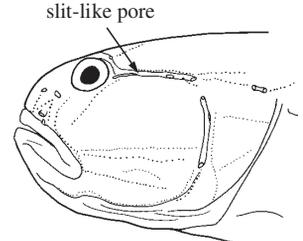


Fig. 26 *Aulopareia cyanomos*

- 72a. Mouth terminal; snout pointed or rounded, tip not overhanging upper lip; no free flap or frenum on lower jaw, skin joining lower lip to isthmus. → 73
- 72b. Mouth subterminal; snout rounded to blunt, with tip slightly overhanging upper lip; free flap or frenum on lower jaw in front of isthmus may be visible (coral reefs, estuaries) *Istigobius* (in part)

- 73a. Pre-pelvic area naked; snout relatively long, depressed and pointed; jaws ending below rear half of eye; cheek and opercle naked; 0 to 4 predorsal scales present (may be embedded); second dorsal fin with 1 spine and 8 soft rays (estuarine) *Afurcagobius*
- 73b. Pre-pelvic area with some scales, may be large and deciduous; snout short, rounded to pointed, not depressed; jaws may end below anterior part of eye or mideye; cheek and opercle naked or partly scaled; predorsal scales present or absent; second dorsal fin with 1 spine and 7 to 11 soft rays → 74

- 74a. Sensory papillae rows on cheek very short, papillae small and few (Fig. 27); head pointed in dorsal view; eyes large and set high on side of head (Fig. 27); pelvic fins may have frenum reduced or absent; membrane between fifth pelvic-fin rays may be reduced, pelvic fins separate in some species; first dorsal fin generally triangular and conspicuously marked; when live, body translucent with black, brown, and white markings (coral reefs) *Fusigobius*

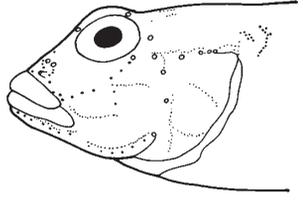


Fig. 27 *Fusigobius neophytus* (after Akihito et al., 1988)

- 74b. Most sensory papillae rows on cheek long (or multiple) and conspicuous; head may be pointed or rounded in dorsal view; eye variable in size but usually not large and set high on side of head; pelvic fins always with frenum present; fifth pelvic-fin rays always joined by membrane; first dorsal fin variable in shape, but generally without conspicuous black marks; when live, body opaque, colour variable → 75

- 75a. Single row of papillae usually present across rear of chin, if large patch of papillae present on chin, then some papillae rows on side of head multiple, row directly under eye always single (Fig. 28); snout usually rounded; scales may be present on opercle or on cheek behind eye; dorsal-fin spines may be long and at least second spine filamentous in both sexes; body colour pattern variable (reefs, estuaries, deep water) . . . *Acentrogobius* (in part)
- 75b. Large patch of papillae on chin; on cheek, multiple short irregular rows of papillae (may be vertically oriented) present between 2 lowermost longitudinal papillae rows and papillae row directly under eye double (Fig. 29), or 5 to 6 longitudinal rows of papillae on cheek, none multiple (Fig. 30); first or second dorsal-fin spine may be elongate in mature males; snout short and pointed; no scales on cheek or opercle; body whitish to pale yellowish with fine dark spots and speckles, dark spots along midside of body smaller than eye (sandy habitats near shallow reefs and estuaries) *Favonigobius*

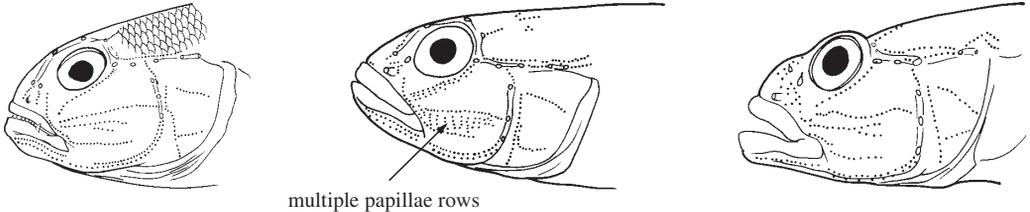


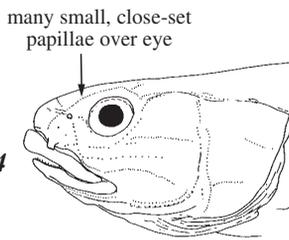
Fig. 28 *Acentrogobius audax* Fig. 29 *Favonigobius melanobranchus* Fig. 30 *Favonigobius opalescens*

Key to the genera of Gobionellinae occurring in the area

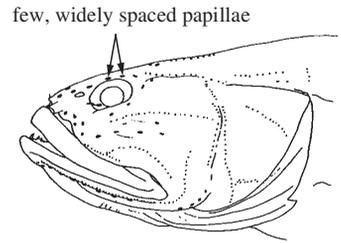
- 1a. Head pores absent → 2
- 1b. Head pores present (sometimes only preopercular pores present) → 8

- 2a. First element of second dorsal and anal fins always unsegmented → 3
- 2b. All elements of second dorsal and anal fins segmented → 6

- 3a. Papillae in interorbital space numerous, small, close-set, forming long curved row around top of each eye (Fig. 31a); mouth may be enlarged in males → 4



a) *Mugilogobius cavifrons*



b) *Eugnathogobius microps*

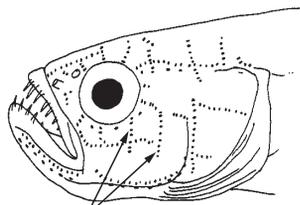
Fig. 31

- 3b. Papillae in interorbital space few, widely spaced in loose row around each eye (Fig. 31b); mouth extremely enlarged in males → 5

- 4a. Intestine long and coiled into 3 loops; pectoral-fin rays 11 to 13 (restricted to Australia) *Chlamydogobius*
- 4b. Intestine simple, with single "S-bend" loop; pectoral-fin rays 13 to 20 (Indo-Pacific) *Mugilogobius*

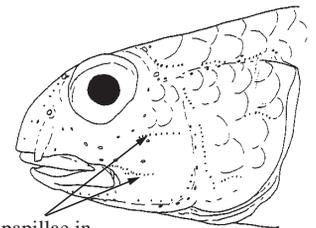
- 5a. Segmented caudal-fin rays 16; several estuarine species, pale to brownish with dark spots and blotches *Calamiana* (in part)
- 5b. Segmented caudal-fin rays 17; a single estuarine species, plain grey colour *Eugnathogobius* (in part)

- 6a. Body usually naked below first dorsal fin; head papillae in transverse pattern (Fig. 32a); body transparent or yellowish translucent in life (fresh and brackish waters) *Gobiopterus*



head papillae in transverse pattern
a) *Gobiopterus chuno*

- 6b. Body usually fully scaly; head papillae usually in longitudinal pattern (Fig. 32b); body with dusky bands or spots → 7



head papillae in longitudinal pattern
b) *Pseudogobius javanicus*

Fig. 32

- 7a. Adults small, up to 25 mm standard length; robust-bodied gobies with distinctive banded colour pattern (brackish to fresh water) ***Brachygobius***
- 7b. Adults very small, at most reaching 15 mm standard length; slender-bodied gobies with 1 dusky band extending from first dorsal fin, remainder of body with incomplete bands and blotches (brackish water) ***Pandaka***

- 8a. None or 1 pair of pores present on snout (Fig. 33a) → **9**
- 8b. Two pairs of pores present on snout (Fig. 33b) → **16**

- 9a. Body naked, mostly fresh water. ***Schismatogobius***
- 9b. Body scaly, at least on its posterior half; brackish to fresh water → **10**

- 10a. Segmented caudal-fin rays 17 → **12**
- 10b. Segmented caudal-fin rays 16 → **11**

- 11a. Mouth terminal, enlarged in males; gut simple, forming "S-bend" loop; head pores usually absent ***Calamiana*** (in part)
- 11b. Mouth small, usually subterminal, with rounded snout overhanging mouth; some head pores always present; entire gut spirally coiled about its longitudinal axis ***Pseudogobius***

- 12a. Head papillae with many transverse rows (Fig. 34); head pores typically present but lateral canal over opercle always absent; distinctively spotted species ***Stigmatogobius***
- 12b. Head papillae longitudinal; if transverse rows present, then lateral canal over preopercle and/or opercle present also; coloration variable → **13**

- 13a. Preopercular pores and lateral canal always absent; gut long and coiled into many loops (12 or more); mouth small, lower lip reduced, thin and folded forward. ***Hemigobius***
- 13b. Preopercular pores and lateral canal present or absent (depending on species); gut short, with only 2 or 3 loops; jaws may be greatly enlarged in males, lips not reduced and thin → **14**

- 14a. No pores over top of opercle (1 present above rear margin of preopercle); preopercular pores present or absent; second dorsal and anal fins with equal numbers of rays, or second dorsal fin with 1 more ray than anal fin → **15**
- 14b. Two pores present over top of opercle (as well as 1 present above rear margin of preopercle); 3 preopercular pores usually present; anal fin with 1 or 2 more rays than in second dorsal fin ***Rhinogobius***

- 15a. Head depressed; body cylindrical or somewhat elongate; mouth large, especially in males, reaching beyond middle of eye. ***Eugnathogobius*** (in part)
- 15b. Head compressed, body often compressed, few species elongate; mouth small and terminal in females, large and inferior to subinferior in males ***Redigobius***

- 16a. Shoulder girdle under gill cover with distinct fleshy lobes (Fig. 35; 1 to 4 finger-like flaps) → **17**
- 16b. Shoulder girdle under gill cover smooth or with minute bumps → **18**

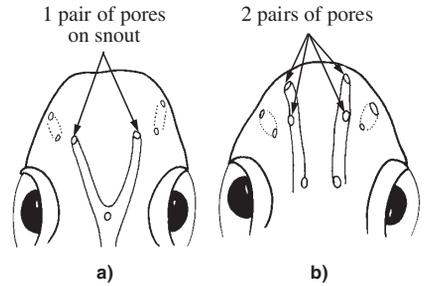
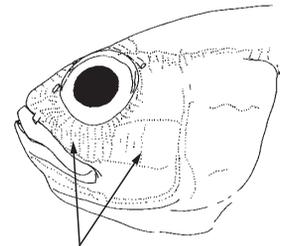


Fig. 33 dorsal view of head



many transverse rows of head papillae

Fig. 34 *Stigmatogobius sadanundio*

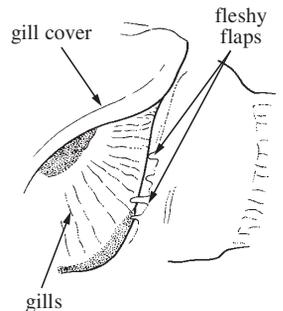


Fig. 35

- 17a. Head broader than deep; mouth inferior with fleshy lips; predorsal scale count 16 to 42; body with rows of blotches and spots *Awaous*
- 17b. Head compressed, narrower than deep; mouth terminal, lips not particularly fleshy; predorsal scale count 0 to 23; body with variably developed transverse bands *Stenogobius*
- 18a. Cheek with large scales; teeth at sides of upper jaw directed medially; anterior interorbital pore paired; mouth horizontal, inferior (coral reefs) *Gnatholepis*
- 18b. Cheek naked; teeth at sides of jaws vertical or directed posteriorly → 19
- 19a. Median membranous crest or ridge usually present on nape; teeth in upper jaw usually in a single row, may have a few teeth on inner row anteriorly; eye with or without fleshy knob or tentacle; tongue rounded *Oxyurichthys*
- 19b. No crest or ridge on nape; typically, teeth in upper jaw in 2 or 3 rows; eye always without fleshy knob or tentacle; tongue truncate *Oligolepis*

Key to the genera of Oxudercinae occurring in the area

- 1a. Lower eyelid (dermal cup) absent → 2
- 1b. Lower eyelid (dermal cup) present (Fig. 36) → 7
- 2a. First dorsal fin with V spines → 3
- 2b. First dorsal fin with VI spines → 5
- 3a. Second dorsal fin with 23 or fewer total elements; anal fin with 23 or fewer total elements *Apocryptes*
- 3b. Second dorsal fin with 27 or more total elements; anal fin with 26 or more total elements → 4
- 4a. Second dorsal fin with 27 to 30 soft rays; caudal-fin length typically more than 23% of standard length; head length greater than 22% of standard length *Zappa*
- 4b. Second dorsal fin with I spine and 28 to 32 soft rays; caudal-fin length 23% of standard length or less; head length less than 22% of standard length *Pseudapocryptes*
- 5a. Second dorsal fin with 24 or fewer total elements, modally fewer; anal fin with 23 or fewer total elements; longitudinal scale count fewer than 60 *Apocryptodon*
- 5b. Second dorsal fin with 24 or more total elements, modally more; anal fin with 24 or more total elements, modally more; longitudinal scale count typically more than 60 → 6
- 6a. No prominent canine tooth lateral to upper jaw symphysis; head length 24% of standard length or less; second dorsal-fin base typically 45% of standard length or greater; caudal-fin length 19% of standard length or greater *Parapocryptes*
- 6b. Prominent canine tooth (about twice as long as others) on each side of upper jaw symphysis; head length 24% of standard length or greater; second dorsal-fin base 45% of standard length or less; caudal-fin length 19% of standard length or less *Oxuderces*
- 7a. Two canine teeth internal to lower jaw symphysis; anal-fin base and second dorsal-fin base 34% of standard length or greater → 8
- 7b. No canine teeth internal to lower jaw symphysis; anal-fin base and second dorsal-fin base 27% of standard length or less → 9
- 8a. Barbels present on underside of head *Scartelaos*
- 8b. No barbels on underside of head *Boleophthalmus*

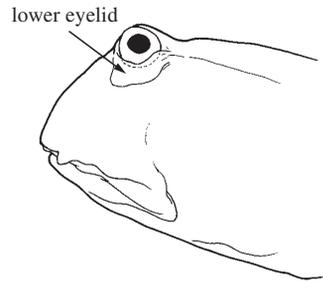
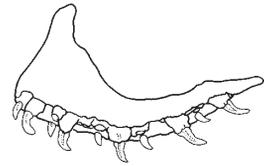


Fig. 36 *Boleophthalmus caeruleomaculatus*

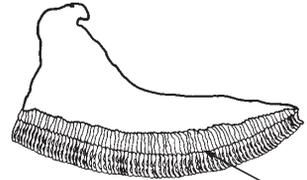
- 9a. A single row of teeth in upper jaw; teeth blunt, not curved *Periophthalmus*
- 9b. Two rows of teeth in upper jaw; outermost teeth large and curved *Periophthalmodon*

Key to the genera of Sicydiinae occurring in the area

- 1a. Comb-like or tricuspid teeth in either upper or lower jaw, conical teeth may be present also (Fig. 37a) → 2
- 1b. No comb-like or tricuspid teeth in either jaw, only conical teeth present (Fig. 37b) *Sicyopus*
- 2a. Upper jaw with small tricuspid teeth at front and conical teeth at side; lower jaw with small horizontal teeth at front only and conical teeth behind *Lentipes*
- 2b. Upper jaw with all tricuspid teeth; lower jaw with horizontal teeth along whole length and conical teeth behind → 3
- 3a. Gap in middle of upper jaw tooth rows; more than 50 scales in lateral series *Sicyopterus*
- 3b. No gap in middle of upper jaw tooth rows which form continuous band of tricuspid teeth; fewer than 50 scales in lateral series *Stiphodon*



a) *Sicyopus*



comb-like teeth

b) *Sicyopterus*

Fig. 37 dentition of left upper and lower jaws

(after Sakai and Nakamura, 1979)

List of marine and brackish water species occurring in the area

Species which live in fresh water but may occur in estuaries as adults or larvae are marked by an asterisk (*). Listed are 105 genera (including 3 new genera for described species of amblyopines), and 534 species (undescribed species not included).

Subfamily AMBLYOPINAE

- Amblyotrypauchen arctocephalus* (Alcock, 1890)
- Brachyamblyopus brachysoma* (Bleeker, 1853)
- Caragobius coecus* (Weber, 1913)
- Caragobius geomys* Fowler, 1935
- Caragobius monserrati* (Roxas and Ablan, 1940)
- Caragobius olivaceus* (Herre, 1927)
- Caragobius rubristriatus* (Saville-Kent, 1889)
- Caragobius typhlops* Smith and Seale, 1906
- Caragobius urolepis* (Bleeker, 1852)
- Ctenotrypauchen microcephalus* (Bleeker, 1860)
- New genus (A) *jacksoni* (Smith, 1943)
- New genus (B) *nigrimarginatus* (Hora, 1924)
- New genus (C) *sumatranus* (Volz, 1903)
- Odontamblyopus rubicundus* (Hamilton-Buchanan, 1822)
- Odontamblyopus tenuis* (Day, 1876)
- Pseudotrypauchen multiradiatus* Hardenberg, 1931
- Taenioides anguillaris* (Linnaeus, 1758)

Taenioides caniscopulus Roxas and Ablan, 1938
Taenioides cirratus (Blyth, 1860)
Taenioides eruptionis (Bleeker, 1849)
Taenioides gracilis (Valenciennes, 1837)
Taenioides mordax (De Vis, 1883)
Taenioides purpurascens (De Vis, 1884)
Trypauchen raha Popta, 1922
Trypauchen taenia Koumans, 1953
Trypauchen totoyensis (Garman, 1903)
Trypauchen vagina (Bloch and Schneider, 1801)
Trypauchenichthys sumatrensis Hardenberg, 1931
Trypauchenichthys typus (Bleeker, 1860)

Subfamily GOBIINAE

Acentrogobius audax Smith, 1959
Acentrogobius bifrenatus (Kner, 1856)
Acentrogobius caninus (Valenciennes, 1837)
Acentrogobius frenatus (Günther, 1861)
Acentrogobius gracilis (Bleeker, 1875)
Acentrogobius janthinopterus (Bleeker, 1852)
Acentrogobius leftwichi (Ogilby, 1910)
Acentrogobius madraspatensis (Day, 1868)
Acentrogobius moloanus (Herre, 1927)
Acentrogobius nebulosus (Forsskål, 1775)
Acentrogobius pyrops (Whitley, 1954)
Acentrogobius suluensis (Herre, 1927)
Acentrogobius viganensis (Steindachner, 1893)
Acentrogobius viridipunctatus (Valenciennes, 1837)
Afurcagobius tamarensis (Johnston, 1883)
Amblyeleotris aurora (Polunin and Lubbock, 1977)
Amblyeleotris callopareia Polunin and Lubbock, 1979
Amblyeleotris delicatulus Smith, 1958
Amblyeleotris diagonalis Polunin and Lubbock, 1979
Amblyeleotris exilis (Smith, 1958)
Amblyeleotris fasciata (Herre, 1953)
Amblyeleotris fontanesii (Bleeker, 1852)
Amblyeleotris guttata (Fowler, 1938)
Amblyeleotris gymnocephala (Bleeker, 1853)
Amblyeleotris japonica Takagi, 1957
Amblyeleotris latifasciata Polunin and Lubbock, 1979
Amblyeleotris macronema Polunin and Lubbock, 1979
Amblyeleotris novaecaledoniae Goren, 1981
Amblyeleotris ogasawarenis Yanagisawa, 1978
Amblyeleotris periophthalma (Bleeker, 1853)
Amblyeleotris randalli Hoese and Steene, 1978
Amblyeleotris rhyax Polunin and Lubbock, 1979
Amblyeleotris steinitzi (Klausewitz, 1974)
Amblyeleotris sungami (Klausewitz, 1969)
Amblyeleotris wheeleri Polunin and Lubbock, 1977
Amblyeleotris yanoi Aonuma and Yoshino, 1996
Amblygobius buanensis (Herre, 1927)
Amblygobius bynoensis (Richardson, 1844)
Amblygobius decussatus (Bleeker, 1855)
Amblygobius esakiae (Herre, 1939)
Amblygobius hectori (Smith, 1956)
Amblygobius linki Herre, 1927

Amblygobius nocturnus (Herre, 1945)
Amblygobius phalaena (Valenciennes, 1837)
Amblygobius rainfordi (Whitley, 1940)
Amblygobius sphynx (Valenciennes, 1837)
Asterropteryx bipunctatus Allen and Munday, 1995
Asterropteryx ensiferus (Bleeker, 1874)
Asterropteryx semipunctatus (Rüppell, 1830)
Asterropteryx spinosus (Goren, 1981)
Asterropteryx striatus Allen and Munday, 1995
Aulopareia atripinnatus (Smith, 1931)
Aulopareia cyanomos (Bleeker, 1849)
Aulopareia janetae Smith, 1945
Aulopareia koumansii (Herre, 1937)
Aulopareia spilopterus (Smith, 1932)
Aulopareia unicolor (Valenciennes, 1837)
Austrolethops wardi Whitley, 1935
Barbuligobius boehlkei Lachner and McKinney, 1974
Bathygobius albopunctatus (Valenciennes, 1837)
Bathygobius coalitus (Bennett, 1832)
Bathygobius cocosensis (Bleeker, 1854)
Bathygobius cotticeps (Steindachner, 1880)
Bathygobius cyclopterus (Valenciennes, 1837)
Bathygobius fuscus (Rüppell, 1830)
Bathygobius krefftii (Steindachner, 1866)
Bathygobius laddi (Fowler, 1931)
Bathygobius meggitti (Hora and Mukerji, 1936)
Bathygobius padangensis (Bleeker, 1851)
Bathygobius panayensis (Jordan and Seale, 1907)
Bathygobius petrophilus (Bleeker, 1853)
Bryaninops amplus Larson, 1985
Bryaninops diannae Larson, 1985
Bryaninops erythropterus (Jordan and Seale, 1906)
Bryaninops isis Larson, 1985
Bryaninops loki Larson, 1985
Bryaninops natans Larson, 1985
Bryaninops nexus Larson, 1987
Bryaninops ridens Smith, 1959
Bryaninops tigris Larson, 1985
Bryaninops yongei (Davis and Cohen, 1969)
Cabillus lacertops Smith, 1959
Cabillus macrophthalmus (Weber, 1909)
Cabillus tongarevae (Fowler, 1927)
Callogobius bauchotae Goren, 1979
Callogobius centrolepis Weber, 1909
Callogobius clitellus McKinney and Lachner, 1978
Callogobius crassus McKinney and Lachner, 1984
Callogobius depressus (Ramsay and Ogilby, 1886)
Callogobius flavobrunneus (Smith, 1958)
Callogobius hasselti (Bleeker, 1851)
Callogobius hastatus McKinney and Lachner, 1978
Callogobius liolepis Koumans, 1931
Callogobius maculipinnis (Fowler, 1918)
Callogobius okinawae Snyder, 1908
Callogobius sclateri (Steindachner, 1880)
Callogobius stellatus McKinney and Lachner, 1978

- Callogobius tanegasimae* (Snyder, 1908)
Cristatogobius albius Tchaw-ren, 1959
Cristatogobius lophius Herre, 1927
Cristatogobius nonatoae (Ablan, 1940)
Cryptocentroides cristatus (Macleay, 1881)
Cryptocentroides insignis (Seale, 1910)
Cryptocentrus albidorsus Yanagisawa, 1978
Cryptocentrus bulbiceps (Whitley, 1953)
Cryptocentrus caeruleomaculatus (Herre, 1933)
Cryptocentrus cebuanus Herre, 1927
Cryptocentrus cinctus (Herre, 1936)
Cryptocentrus cyanotaenia (Bleeker, 1853)
Cryptocentrus diproctotaenia (Bleeker, 1876)
Cryptocentrus fasciatus (Playfair, 1866)
Cryptocentrus filifer (Valenciennes, 1837)
Cryptocentrus inexplicatus (Herre, 1934)
Cryptocentrus insignitus (Whitley, 1956)
Cryptocentrus leonis Smith, 1931
Cryptocentrus leptocephalus Bleeker, 1876
Cryptocentrus leucostictus (Günther, 1872)
Cryptocentrus lutheri Klausewitz, 1960
Cryptocentrus maudae Fowler, 1937
Cryptocentrus niveatus (Valenciennes, 1837)
Cryptocentrus obliquus (Herre, 1934)
Cryptocentrus pavoninoides (Bleeker, 1854)
Cryptocentrus pretiosus (Rendahl, 1924)
Cryptocentrus shigensis Kuroda, 1956
Cryptocentrus strigiliceps (Jordan and Seale, 1906)
Cryptocentrus wehrlei Fowler, 1937
Ctenogobiops aurocingulus (Herre, 1935)
Ctenogobiops crocineus Smith, 1959
Ctenogobiops feroculus Lubbock and Polunin, 1977
Ctenogobiops pomastictus Lubbock and Polunin, 1977
Ctenogobiops tangaroai Lubbock and Polunin, 1977
Discordipinna griessingeri Hoese and Fourmanoir, 1978
Drombus dentifer Hora, 1923
Drombus globiceps (Hora 1923)
Drombus halei (Whitley, 1935)
Drombus kranjiensis (Herre, 1940)
Drombus ocyurus Jordan and Seale, 1906
Drombus simulus (Smith, 1960)
Drombus triangularis (Weber, 1911)
Echinogobius hayashii Iwata, Hosoya, and Niimura, 1998
Egglestonichthys bombylios Larson and Hoese, 1997
Egglestonichthys melanoptera (Rao, 1971)
Eviota afelei Jordan and Seale, 1906
Eviota albolineata Jewett and Lachner, 1983
Eviota bifasciata Lachner and Karnella, 1980
Eviota cometa Jewett and Lachner, 1983
Eviota distigma Jordan and Seale, 1906
Eviota fasciola Karnella and Lachner, 1981
Eviota herrei Jordan and Seale, 1906
Eviota infulata (Smith, 1956)
Eviota irrasa Karnella and Lachner, 1981
Eviota lachdeberiei Giltay, 1933

- Eviota latifasciata* Jewett and Lachner, 1983
Eviota melasma Lachner and Karnella, 1980
Eviota monostigma Fourmanoir, 1971
Eviota nebulosa Smith, 1958
Eviota nigriventris Giltay, 1933
Eviota pellucida Larson, 1976
Eviota prasina (Klunzinger, 1871)
Eviota prasites Jordan and Seale, 1906
Eviota pseudostigma Lachner and Karnella, 1980
Eviota punctulata Jewett and Lachner, 1983
Eviota queenslandica Whitley, 1932
Eviota saipanensis Fowler, 1945
Eviota sebreei Jordan and Seale, 1906
Eviota sigillata Jewett and Lachner, 1983
Eviota smaragdus Jordan and Seale, 1906
Eviota sparsa Jewett and Lachner, 1983
Eviota spilota Lachner and Karnella, 1980
Eviota storthynx (Rofen, 1959)
Eviota variola Lachner and Karnella, 1980
Eviota zebrina Lachner and Karnella, 1978
Eviota zonura Jordan and Seale, 1906
- Exyrias belissimus* (Smith, 1959)
Exyrias ferrarisi Murdy, 1985
Exyrias puntang (Bleeker, 1851)
- Favonigobius exquisitus* Whitley, 1950
Favonigobius lentiginosus (Richardson, 1844)
Favonigobius melanobranchus (Fowler, 1934)
Favonigobius opalescens (Herre, 1936)
Favonigobius reichei (Bleeker, 1853)
- Feia nympha* Smith, 1959
- Fusigobius duospilos* Hoese and Reader, 1985
Fusigobius longispinus Goren, 1978
Fusigobius neophytus (Günther, 1877)
Fusigobius signipinnis Hoese and Obika, 1988
- Gladiogobius ensifer* Herre, 1933
- Glossogobius aureus* Akihito and Meguro, 1975
Glossogobius bicirrhosus (Weber, 1894)
Glossogobius celebius (Valenciennes, 1837)
Glossogobius circumspectus (Macleay, 1883)
Glossogobius giuris (Hamilton, 1822)
Glossogobius sparsipapillus Akihito and Meguro, 1976
- Gobiodon acicularis* Harold and Winterbottom, 1995
Gobiodon albofasciatus Sawada and Arai, 1972
Gobiodon atrangulatus Garman, 1903
Gobiodon axillaris De Vis, 1884
Gobiodon brochus Harold and Winterbottom, 1999
Gobiodon ceramensis (Bleeker, 1852)
Gobiodon citrinus (Rüppell, 1838)
Gobiodon fulvus Herre, 1927
Gobiodon heterospilos Bleeker, 1856
Gobiodon histrio (Valenciennes, 1837)
Gobiodon micropus Günther, 1861
Gobiodon okinawae Sawada, Arai, and Abe, 1972
Gobiodon quinquestrigatus (Valenciennes, 1837)
Gobiodon reticulatus Playfair, 1866
Gobiodon rivulatus (Rüppell, 1830)

- Gobiodon spilophthalmus* Fowler, 1944
Gobiodon unicolor (Castelnau, 1873)
Gobiopsis angustifrons Lachner and McKinney, 1978
Gobiopsis aporia Lachner and McKinney, 1978
Gobiopsis bravoii (Herre, 1940)
Gobiopsis exigua Lachner and McKinney, 1979
Gobiopsis macrostoma Steindachner, 1861
Gobiopsis malekulae (Herre, 1935)
Gobiopsis quinquecincta (Smith, 1931)
Gobiopsis springeri Lachner and McKinney, 1979
Gobiopsis woodsi Lachner and McKinney, 1978
Hazeus otakii Jordan and Snyder, 1901
Hetereleotris poecila (Fowler, 1946)
Isthmogobius baliurus (Valenciennes, 1837)
Istigobius decoratus (Herre, 1927)
Istigobius diadema (Steindachner, 1877)
Istigobius goldmanni (Bleeker, 1852)
Istigobius hoesei Murdy and McEachran, 1982
Istigobius nigroocellatus (Günther, 1873)
Istigobius ornatus (Rüppell, 1830)
Istigobius rigilius (Herre, 1953)
Istigobius spencei (Smith, 1947)
Kelloggella quindecimfasciata (Fowler, 1946)
Kelloggella cardinalis Jordan and Seale, 1906
Lobulogobius morrighu Larson, 1983
Lobulogobius omanensis Koumans, 1944
Lophogobius bleekeri Popta, 1921
Lotilia graciliosa Klausewitz, 1960
Lubricogobius ornatus Fourmanoir, 1966
Lubricogobius pumilis Larson and Hoese, 1980
Luposicya lupus Smith, 1959
Macrodontogobius wilburi Herre, 1936
Mahidolia mystacina (Valenciennes, 1837)
Mangarinus waterousi Herre, 1943
Myersina crocatus (Wongratana, 1975)
Myersina lachneri Hoese and Lubbock, 1982
Myersina macrostoma Herre, 1934
Myersina nigrivirgata Akihito and Meguro, 1983
Myersina papuensis (Peters, 1876)
Obliquogobius cometes (Alcock, 1890)
Oplopomops diacanthus (Schultz, 1943)
Oplopomus caninoides (Bleeker, 1852)
Oplopomus oplopomus (Valenciennes, 1837)
Opua nephodes Jordan, 1925
Palutrus pruinosus (Jordan and Seale, 1906)
Palutrus scapulopunctatus (Beaufort, 1912)
Parachaeturichthys ocellatus (Day, 1873)
Parachaeturichthys polynemus (Bleeker, 1853)
Paragobioidon echinocephalus (Rüppell, 1830)
Paragobioidon lacunicolus (Kendall and Goldsborough, 1911)

- Paragobiodon melanosomus* (Bleeker, 1852)
Paragobiodon modestus (Regan, 1908)
Paragobiodon xanthosomus (Bleeker, 1852)
Parkraemeria ornata Whitley, 1951
Phyllogobius platycephalops (Smith, 1964)
Platygobiopsis akihito Springer and Randall, 1992
Pleurosicya annandalei Hornell and Fowler, 1922
Pleurosicya australis Larson, 1990
Pleurosicya bilobata (Koumans, 1941)
Pleurosicya boldinghi Weber, 1913
Pleurosicya carolinensis Larson, 1990
Pleurosicya coerulea Larson, 1990
Pleurosicya elongata Larson, 1990
Pleurosicya fringilla Larson, 1990
Pleurosicya labiata (Weber, 1913)
Pleurosicya micheli Fourmanoir, 1971
Pleurosicya mossambica Smith, 1959
Pleurosicya muscarum (Jordan and Seale, 1906)
Pleurosicya plicata Larson, 1990
Pleurosicya prognatha Goren, 1984
Pleurosicya spongicola Larson, 1990
Priolepis agrena Winterbottom and Burrige, 1993
Priolepis ailina Winterbottom and Burrige, 1993
Priolepis aithiops Winterbottom and Burrige, 1992
Priolepis aureoviridis (Gosline, 1959)
Priolepis cincta (Regan, 1908)
Priolepis compita Winterbottom, 1985
Priolepis fallacineta Winterbottom and Burrige, 1992
Priolepis inhaca (Smith, 1949)
Priolepis kappa Winterbottom and Burrige, 1991
Priolepis nocturna (Smith, 1957)
Priolepis nuchifasciata (Günther, 1973)
Priolepis pallidicincta Winterbottom and Burrige, 1993
Priolepis profunda (Weber, 1909)
Priolepis semidoliata (Valenciennes, 1837)
Priolepis squamogena Winterbottom and Burrige, 1989
Priolepis sticta Winterbottom and Burrige, 1992
Priolepis triops Winterbottom and Burrige, 1993
Psammogobius biocellatus (Valenciennes, 1837)
Psilogobius mainlandi Baldwin, 1972
Psilogobius prolatus Watson and Lachner, 1985
Signigobius biocellatus Hoese and Allen, 1977
Silhouettea evanida Larson and Miller, 1986
Silhouettea hoesei Larson and Miller, 1986
Silhouettea insinuans Smith, 1959
Silhouettea nuchipunctata (Herre, 1934)
Stonogobiops nematodes Hoese and Randall, 1982
Stonogobiops xanthorhinica Hoese and Randall, 1982
Sueviota aprica Winterbottom and Hoese, 1988
Sueviota lachneri Winterbottom and Hoese, 1988
Sueviota larsonae Winterbottom and Hoese, 1988
Tomiyamichthys latruncularia (Klausewitz, 1974)
Tomiyamichthys oni (Tomiyama, 1936)

Trimma benjamini Winterbottom, 1996
Trimma caesiura Jordan and Seale, 1906
Trimma caudimaculata Yoshino and Araga, 1977
Trimma emeryi Winterbottom, 1985
Trimma grammistes (Tomiyama, 1936)
Trimma griffithsi Winterbottom, 1984
Trimma hoesei Winterbottom, 1984
Trimma macrophthalma (Tomiyama, 1936)
Trimma mendelssohni (Goren, 1978)
Trimma naudei Smith, 1956
Trimma necopinna Whitley, 1959
Trimma okinawae (Aoyagi, 1949)
Trimma rubromaculata Allen and Munday, 1995
Trimma sheppardi Winterbottom, 1984
Trimma striata (Herre, 1945)
Trimma taylori Lobel, 1979
Trimma tevegae Cohen and Davis, 1969
Trimma unisquamis (Gosline, 1959)
Trimmatom eviotops (Schultz, 1943)
Trimmatom macropodus Winterbottom, 1989
Trimmatom nanus Winterbottom and Emery, 1981
Trimmatom sagma Winterbottom, 1989
Trimmatom zapotes Winterbottom, 1989
Valenciennea alleni Hoese and Larson, 1994
Valenciennea bella Hoese and Larson, 1994
Valenciennea decora Hoese and Larson, 1994
Valenciennea helsdingeni (Bleeker, 1858)
Valenciennea immaculata Ni, 1981
Valenciennea limicola Hoese and Larson, 1994
Valenciennea longipinnis (Lay and Bennett 1839)
Valenciennea muralis (Valenciennes, 1837)
Valenciennea parva Hoese and Larson, 1994
Valenciennea puellaris (Tomiyama, 1955)
Valenciennea randalli Hoese and Larson, 1994
Valenciennea sexguttata (Valenciennes, 1837)
Valenciennea strigata (Broussonet, 1782)
Valenciennea wardi (Playfair, 1866)
Vanderhorstia ambanoro (Fourmanoir, 1957)
Vanderhorstia flavilineata Allen and Munday, 1995
Vanderhorstia lanceolata Yanagisawa, 1978
Vanderhorstia mertensii Klausewitz, 1974
Vanderhorstia ornatissima Smith, 1959

Subfamily GOBIONELLINAE

* *Awaous acritosus* Watson, 1994
 * *Awaous guamensis* Valenciennes, 1837
 * *Awaous litturatus* (Steindachner, 1860)
 * *Awaous melanocephalus* (Bleeker, 1849)
 * *Awaous ocellaris* (Broussonet, 1782)
Brachygobius doriae (Günther, 1868)
Brachygobius kabiliensis Inger, 1958
Brachygobius xanthozona (Bleeker, 1849)
Calamiana kabilia (Herre, 1940)
Calamiana mindora (Herre, 1945)
Calamiana variegata (Peters, 1869)
Chlamydogobius ranunculus (Larson, 1995)

- Eugnathogobius microps* Smith, 1931
Gnatholepis anjerensis (Bleeker, 1851)
Gnatholepis cauerensis (Bleeker, 1853)
Gnatholepis deltoides (Seale, 1901)
Gnatholepis inconsequens Whitley, 1958
Gnatholepis scapulostigma Herre, 1953
Gobiopterus brachypterus (Bleeker, 1855)
Gobiopterus chuno (Hamilton, 1822)
Gobiopterus luzonensis (Smith, 1902)
Gobiopterus panayensis (Herre, 1944)
Gobiopterus semivestitus (Munro, 1949)
Hemigobius hoevenii (Bleeker, 1851)
Hemigobius mingi (Herre, 1936)
Mugilogobius cavifrons (Weber, 1909)
Mugilogobius chulae (Smith, 1932)
Mugilogobius fusca (Herre, 1940)
Mugilogobius fuscus (Nichols, 1951)
Mugilogobius mertonii (Weber, 1911)
Mugilogobius notospilus (Günther, 1877)
Mugilogobius platynotus (Günther, 1861)
Mugilogobius platystomus (Günther, 1872)
Mugilogobius rambaiae (Smith, 1945)
Mugilogobius stigmaticus (De Vis, 1884)
Oligolepis acutipennis (Valenciennes, 1837)
Oligolepis jaarmani (Weber, 1913)
Oligolepis stomias (Smith, 1941)
Oxyurichthys auchenolepis Bleeker, 1867
Oxyurichthys cornutus McCulloch and Waite, 1918
Oxyurichthys lonchotus (Jenkins, 1903)
Oxyurichthys microlepis (Bleeker, 1849)
Oxyurichthys notonema (Weber, 1909)
Oxyurichthys ophthalmonema (Bleeker, 1856)
Oxyurichthys papuensis (Valenciennes, 1837)
Oxyurichthys takagi Pezold, 1998
Oxyurichthys tentacularis (Valenciennes, 1837)
Oxyurichthys uronema (Weber, 1909)
Pandaka pusilla Herre, 1927
Pandaka pygmaea Herre, 1927
Pandaka rouxi (Weber, 1911)
Pandaka trimaculata Akihito and Meguro, 1975
Pandaka lidwilli (McCulloch, 1917)
Pseudogobius avicennia (Herre, 1940)
Pseudogobius javanicus (Bleeker, 1856)
Pseudogobius melanostictus (Day, 1876)
Pseudogobius poecilosomus (Bleeker, 1849)
Redigobius balteatus (Herre, 1935)
Redigobius bikolanus (Herre, 1927)
Redigobius chrysosomus (Bleeker, 1875)
Redigobius macrostomus (Günther, 1861)
Redigobius roemeri (Weber, 1911)
* *Rhinogobius giurinus* (Rutter, 1897)
* *Stenogobius alleni* Watson, 1991
* *Stenogobius beauforti* (Weber, 1908)
* *Stenogobius blokzeyli* (Bleeker, 1861)

- * *Stenogobius caudimaculosus* Watson, 1991
- * *Stenogobius fehlmanni* Watson, 1991
- * *Stenogobius gymnopomus* (Bleeker, 1853)
- * *Stenogobius hoesei* Watson, 1991
- * *Stenogobius ingeri* Watson, 1991
- * *Stenogobius kyphosus* Watson, 1991
- * *Stenogobius lachneri* Watson, 1994
- * *Stenogobius laterisquamatus* (Weber, 1905)
- * *Stenogobius marinus* Watson, 1991
- * *Stenogobius marqueti* Watson, 1991
- * *Stenogobius ophthalmoporus* (Bleeker, 1853)
- * *Stenogobius psilosinionus* Watson, 1991
- * *Stenogobius randalli* Watson, 1991
- * *Stenogobius squamosus* Watson, 1991
- * *Stenogobius zurstrasseni* (Popta, 1912)

Stigmatogobius borneensis (Bleeker, 1851)
Stigmatogobius pleurostigma (Bleeker, 1849)
Stigmatogobius sadanundio (Hamilton, 1822)
Stigmatogobius sella (Steindachner, 1881)

Subfamily OXUDERCINAE

- Apocryptodon madurensis* (Bleeker, 1849)
- Boleophthalmus birdsongi* Murdy, 1989
Boleophthalmus boddarti (Pallas, 1770)
Boleophthalmus caeruleomaculatus McCulloch and Waite, 1918
- Oxuderces dentatus* (Eydoux and Souleyet, 1848)
Oxuderces wirzi (Koumans, 1937)
- Parapocryptes serperaster* (Richardson, 1846)
- Periophthalmodon freycineti* (Valenciennes, 1824)
Periophthalmodon schlosseri (Pallas, 1770)
Periophthalmodon septemradiatus (Hamilton, 1822)
- Periophthalmus argentilineatus* Valenciennes, 1837
Periophthalmus chrysopilos Bleeker, 1852
Periophthalmus gracilis Eggert, 1935
Periophthalmus kalolo Lesson, 1830
Periophthalmus malaccensis Eggert, 1935
Periophthalmus minutus Eggert, 1935
Periophthalmus novaeaguineensis Eggert, 1935
Periophthalmus novemradiatus (Hamilton, 1822)
Periophthalmus weberi Eggert, 1935
- Pseudapocryptes borneensis* (Bleeker, 1855)
Pseudapocryptes elongatus (Cuvier, 1816)
- Scartelaos histophorus* (Valenciennes, 1837)

Subfamily SICYDIINAE

- * *Lentipes crittersius* Watson and Allen, 1999
- * *Lentipes dimetrodon* Watson and Allen, 1999
- * *Lentipes watsoni* Allen, 1997
- * *Lentipes whittenorum* Watson and Kottelat, 1994
- * *Sicyopterus cynocephalus* (Valenciennes, 1837)
- * *Sicyopterus eudentatus* Parenti and Maciolek, 1993
- * *Sicyopterus hageni* Popta, 1921
- * *Sicyopterus japonicus* (Tanaka, 1909)
- * *Sicyopterus lividis* Parenti and Maciolek, 1993
- * *Sicyopterus longifilis* De Beaufort, 1912

- * *Sicyopterus macrostetholepis* (Bleeker, 1853)
- * *Sicyopterus marquesensis* Fowler, 1932
- * *Sicyopterus microcephalus* (Bleeker, 1854)
- * *Sicyopterus micrurus* (Bleeker, 1853)
- * *Sicyopterus ouwensi* Weber, 1913
- * *Sicyopterus parvei* (Bleeker, 1853)
- * *Sicyopterus pugnans* (Ogilvie-Grant, 1884)
- * *Sicyopterus taeniurus* (Günther, 1877)
- * *Sicyopterus wichmanni* De Beaufort, 1912
- * *Sicyopus auxilimentus* Watson and Kottelat, 1994
- * *Sicyopus bitaeniatus* Maugé et al., 1986
- * *Sicyopus discordipinnis* Watson, 1995
- * *Sicyopus fehlmanni* Parenti and Maciolek, 1993
- * *Sicyopus leprurus* Sakai and Nakamura, 1979
- * *Sicyopus multisquamatus* De Beaufort, 1912
- * *Sicyopus mystax* Watson and Allen, 1999
- * *Sicyopus nigriradiatus* Parenti and Maciolek, 1993
- * *Sicyopus zosterophorum* (Bleeker, 1856)
- * *Stiphodon allen* Watson, 1996
- * *Stiphodon astilbos* Ryan, 1986
- * *Stiphodon atratus* Watson, 1996
- * *Stiphodon atropurpureus* (Herre, 1927)
- * *Stiphodon birdsong* Watson, 1996
- * *Stiphodon caeruleus* Parenti and Maciolek, 1993
- * *Stiphodon elegans* (Steindachner, 1859)
- * *Stiphodon hydroleibatus* Watson, 1999
- * *Stiphodon larson* Watson, 1996
- * *Stiphodon olivaceus* Watson and Kottelat, 1995
- * *Stiphodon ornatus* Meinken, 1974
- * *Stiphodon pelewensis* Herre, 1936
- * *Stiphodon rutilaureus* Watson, 1996
- * *Stiphodon semoni* Weber, 1895
- * *Stiphodon stevensoni* (Jordan and Seale, 1906)
- * *Stiphodon surrufus* Watson and Kottelat, 1995
- * *Stiphodon zebrinus* Watson, Allen, and Kottelat, 1998

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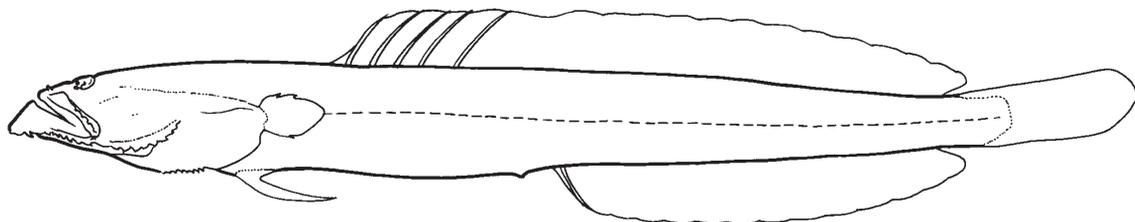
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KRAEMERIIDAE

Sandgobies (sand darts)

by H.K. Larson

Diagnostic characters: Very small (to about 7 cm), elongate gobioid fishes; body cylindrical to somewhat compressed. **Eyes small, close together** and dorsally placed. Mouth moderate, with thick, sometimes scalloped or papillose lips and fleshy, **pointed, distinctly protruding chin. Underside of head, lower preopercular margin, and sometimes lower opercular margin with scalloping or flaps.** Teeth small, sharp, absent from vomer and palatines. Tongue deeply bilobed. Branchiostegal rays 5. Dorsal fin continuous, with IV to VI spines and 13 to 17 soft rays; anal fin with I spine and 11 to 14 soft rays; last ray of dorsal and anal fins split to base, all others simple; pectoral-fin rays 3 to 9; pelvic fins usually separate, with I spine and 5 soft rays; caudal fin rounded, with 11 segmented rays. Scales absent. Vertebrae 10-14 + 16-17. **Colour:** usually transparent or translucent whitish to yellowish white; sometimes with very light brown speckling or mottling.



Kraemeria

Habitat, biology, and fisheries: Two genera in the family and 11 nominal species, all from the Indo-Pacific. Kraemerids burrow in fine coral sand or muddy sand in very shallow marine to estuarine areas and are not often observed. Two species are known to inhabit fresh water. They do not have any commercial importance in the area but may be taken incidentally.

Similar families occurring in the area

Creediidae: similar in appearance and habitat, but with all fin rays segmented, origin of anal fin usually placed before origin of dorsal fin; and no scalloping along lower edge of preopercle.

Microdesmidae: juvenile *Gunnellichthys* may be similar in appearance, but the tongue is simple, they have 28 to 66 segmented dorsal-fin rays and pelvic fins with I spine and 2 to 4 soft rays.



Creediidae



Microdesmidae

List of species occurring in the area

- Gobitrichinotus radiocularis* Fowler, 1943
- Kraemeria bryani* Schultz, 1941
- Kraemeria cunicularia* Rofen, 1958
- Kraemeria galatheaensis* Rofen, 1958
- Kraemeria merensis* Whitley, 1935
- Kraemeria samoensis* Steindachner, 1906
- Kraemeria tongaensis* Rofen, 1958

Reference

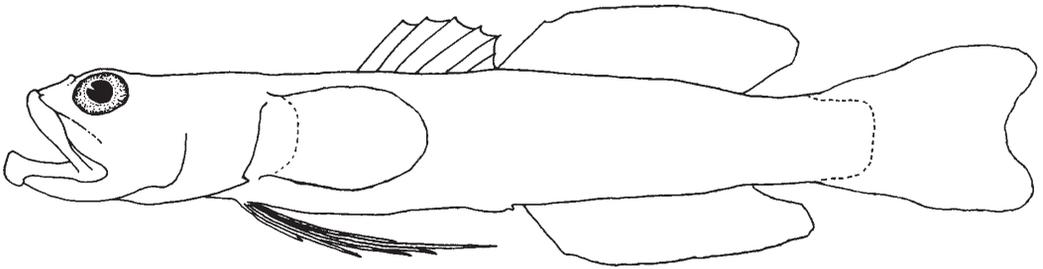
Rofen, R.R. 1958. The marine fishes of Rennell Island. *The natural history of Rennell Island Vol. 1 (vertebrates)*, (10):149-218.

XENISTHMIDAE

Wrigglers

by A.C. Gill

Diagnostic features: Small (to 3.5 cm standard length), moderately elongate to very elongate gobioid fishes; body usually rounded or slightly compressed; head usually slightly depressed. **Lower lip with uninterrupted free ventral margin.** Sensory pores on head present or absent; no pores on lower jaw. **Branchiostegal rays 6.** Two separate dorsal fins (anterior dorsal fin absent in *Tyson*), the first with II to VI spines, and the second with or without a spine, and with 8 to 33 segmented rays. Anal fin with or without a spine, and with 8 to 26 segmented rays. **Pelvic fins not united to form a sucking disk, with or without a spine, and with 0 to 5 segmented rays.** Caudal fin rounded to emarginate; segmented rays 15 (8 in dorsal portion, 7 in ventral portion) or 17 (9 in dorsal portion, 8 in ventral portion). **No tubed lateral-line scales on sides of body; head naked or with small, cycloid scales on cheeks and/or upper part of operculum; body naked or inconspicuously covered with fine scales (45 to 75 in lateral series between upper edge of pectoral-fin base and base of caudal fin).** Premaxillary ascending process greatly reduced; rostral cartilage ossified; basibranchial 2 absent; hypobranchial 3 reduced to small cartilage nubbin or absent. **Colour:** variable; often pale with either vertical dark banding or a midlateral dark stripe.

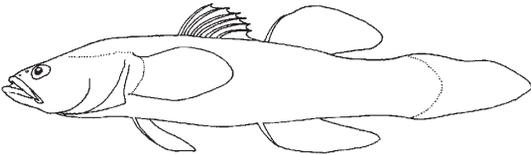


Habitat, biology, and fisheries: Cryptic inhabitants of coral reef and rubble areas in the tropical Indo-Pacific; *Xenisthmus* and *Paraxenisthmus* species are sand divers, living in sand patches adjacent to reef or rubble; occur in tidal pools down to depths of at least 30 m. Very patchy in distribution, with many species known from a single or few specimens. Most species appear to be predatory, feeding on small fishes and crustaceans. No commercial value.

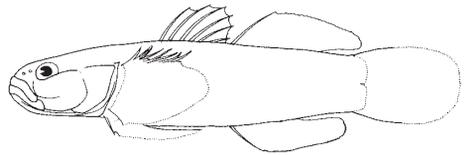
Similar families occurring in the area

Eleotridae: small specimens of certain genera (e.g. *Eleotris*) resemble some xenisthmids, but have an interrupted lower lip, a well-developed premaxillary ascending process, and an unossified rostral cartilage.

Gobiidae: small specimens of some genera might be confused with xenisthmids, but have an interrupted lower lip and fewer than 6 branchiostegal rays; most also have a well-developed premaxillary process, an unossified rostral cartilage, and pelvic fins at least partly fused (usually into a sucking disc).



Eleotridae



Gobiidae

Key to the genera of Xenisthmidae

- 1a. Body very elongate, body depth at anal-fin origin less than 6% standard length; segmented dorsal-fin rays 29 to 33; segmented anal-fin rays 23 to 26 *Allomicrodesmus*
- 1b. Body moderately elongate, body depth at anal-fin origin greater than 10% standard length; segmented dorsal-fin rays 8 to 15; segmented anal-fin rays 8 to 14 → 2

- 2a. Body covered with small scales; first dorsal fin with VI spines; sensory pores present on head; segmented dorsal-, anal-, and pectoral-fin rays branched → 3
- 2b. Body scaleless; first dorsal fin absent or with V spines; no sensory pores on head; segmented dorsal-, anal-, and pectoral-fin rays unbranched → 4
- 3a. Conical teeth present on vomer and palatines; gill rakers absent; all segmented pelvic-fin rays unbranched *Paraxenisthmus*
- 3b. Teeth absent from vomer and palatines; gill rakers present; anterior 4 segmented pelvic-fin rays branched (except in juvenile specimens) *Xenisthmus*
- 4a. First dorsal fin present; pelvic fins with I spine and 5 segmented rays (spine and inner ray vestigial); caudal fin with 9 segmented rays in dorsal portion and 8 in ventral portion; vomerine teeth absent *Rotuma*
- 4b. First dorsal fin absent; pelvic fins without a spine and with a single segmented ray; caudal fin with 8 segmented rays in dorsal portion and 7 in ventral portion; vomerine teeth present *Tyson*

List of species occurring in the area

Note: although only 7 species are listed from the area, additional undescribed species are known. In particular, at least 6 undescribed species of *Xenisthmus* occur in the area.

- Allomicrodesmus doratheae* Schultz, 1966
- Paraxenisthmus springeri* Gill and Hoese, 1993
- Rotuma lewisi* Springer, 1988
- Tyson belos* Springer, 1983
- Xenisthmus chapmani* (Schultz, 1966)
- Xenisthmus clarus* (Jordan and Seale, 1906)
- Xenisthmus polyzonatus* (Klunzinger, 1871)

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Springer, V.G. 1983. *Tyson belos*, new genus and species of western Pacific fish (Gobioidei: Xenisthminae), with discussions of gobioid osteology and classification. *Smithson. Contrib. Zool.*, 390:1-40.

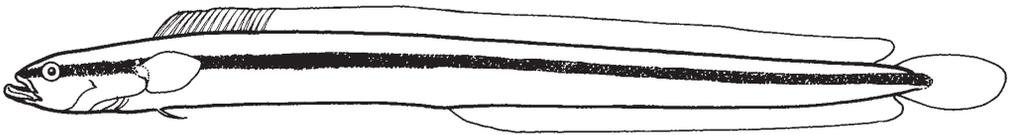
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MICRODESMIDAE

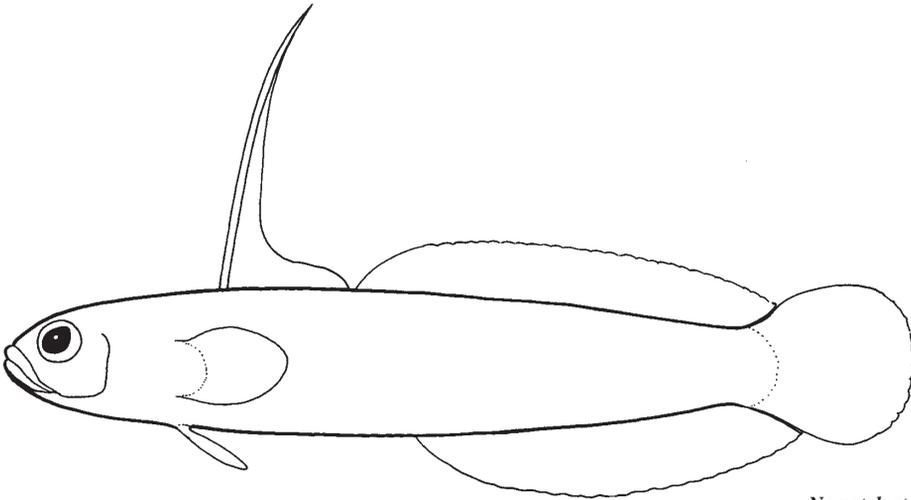
Wormfishes, dart-gobies, fire gobies

by H.K Larson

Diagnostic characters: Elongate, **often highly compressed** gobioid fishes (size to about 12 cm). Eyes large, laterally placed. Mouth small to moderate, often steeply oblique, **chin prominent** (especially pronounced in subfamily Microdesminae). Teeth caniniform, in several rows in jaws; teeth may be present on vomer, always absent from palatines. Dorsal and anal fins often very long based; 2 separate dorsal fins or a single continuous dorsal fin, with VI to XXVIII spines and 9 to 66 soft rays; anal fin with none or I spine and 9 to 61 soft rays; pectoral-fin rays 10 to 26; **pelvic fins usually separate** or nearly so, with I spine and 2 to 5 soft rays and no interspinal membrane (frenum); caudal fin rounded, truncate or emarginate, with 15 to 17 segmented rays. Scales small, usually cycloid; **mostly embedded**, usually not overlapping; scales absent in some species. Lateral scale count 37 to 170. Lateral-line pores on head present or absent, lateral line on body absent. Branchiostegal rays 5. Total vertebrae 26 to 76. Pelvic bone with very long posterior process. **Colour:** variable, **often brightly coloured** with blue or yellow; many microdesmine species with dark longitudinal stripe.



Gunnellichthys

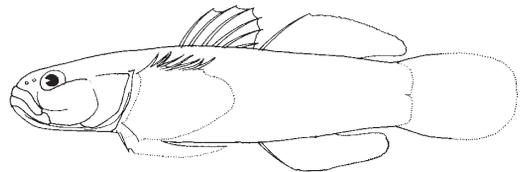


Nemateleotris

Habitat, biology, and fisheries: Eleven genera in the family, which is currently divided into 2 subfamilies, Microdesminae and Ptereleotrinae; 74 species are known world-wide. Microdesmines (wormfishes) are most often found hovering over coral sand banks or seagrass beds on or near coral reefs. Ptereleotrines are found hovering around and in coral reefs; some species form schools (sometimes large), while others occur in pairs or small groups. Microdesmids do not have any commercial importance in the region, other than those favoured by the aquarium industry (blue dart-gobies, fire gobies).

Similar families occurring in the area

Gobiidae: some coral-reef species with separate pelvic fins may look similar to ptereleotrines, but have fewer dorsal-and anal-fin rays (5 to 19), always have I spine and 5 soft rays in the pelvic fins, and have overlapping, usually ctenoid scales on the sides of the body.



Gobiidae

List of species occurring in the area**Subfamily MICRODESMINAE**

- Gunnellichthys curiosus* Dawson, 1968
Gunnellichthys grandoculis (Kendall and Goldsborough, 1911)
Gunnellichthys monostigma Smith, 1958
Gunnellichthys pleurotaenia Bleeker, 1858
Gunnellichthys viridescens Dawson, 1968
Paragunnellichthys seychellensis Dawson, 1967

Subfamily PTERELEOTRINAE

- Aioliops brachypterus* Rennis and Hoese, 1987
Aioliops megastigma Rennis and Hoese, 1987
Aioliops novaeguineae Rennis and Hoese, 1987
Aioliops tetraophthalmus Rennis and Hoese, 1987
Nemateleotris decora Randall and Allen, 1973
Nemateleotris helfrichi Randall and Allen, 1973
Nemateleotris magnifica Fowler, 1938
Oxymetopon cyanoctenosum Klausowitz and Conde, 1981
Oxymetopon filamentosum Fourmanoir, 1967
Oxymetopon typus Bleeker, 1861
Parioglossus aporos Rennis and Hoese, 1985
Parioglossus formosus (Smith, 1931)
Parioglossus lineatus Rennis and Hoese, 1985
Parioglossus neocaledonicus Dingerkus and Seret, 1992
Parioglossus nudus Rennis and Hoese, 1985
Parioglossus palustris (Herre, 1945)
Parioglossus philippinus (Herre, 1945)
Parioglossus rainfordi McCulloch, 1921
Parioglossus raoi (Herre, 1939)
Parioglossus taeniatus Regan, 1912
Parioglossus triquetrus Rennis and Hoese, 1985
Parioglossus verticalis Rennis and Hoese, 1985
Ptereleotris evides (Jordan and Hubbs, 1925)
Ptereleotris grammica Randall and Hoese, 1985
Ptereleotris hanae (Jordan and Snyder, 1901)
Ptereleotris heteroptera (Bleeker, 1855)
Ptereleotris melanopogon Randall and Hoese, 1985
Ptereleotris microlepis (Bleeker, 1856)
Ptereleotris monoptera Randall and Hoese, 1985
Ptereleotris uroditaenia Randall and Hoese, 1985
Ptereleotris zebra (Fowler, 1938)

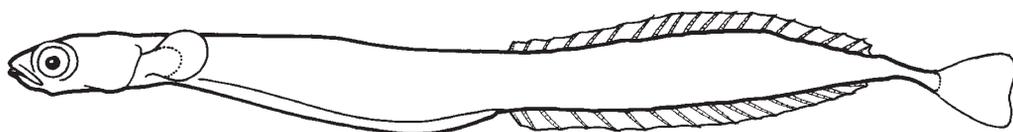
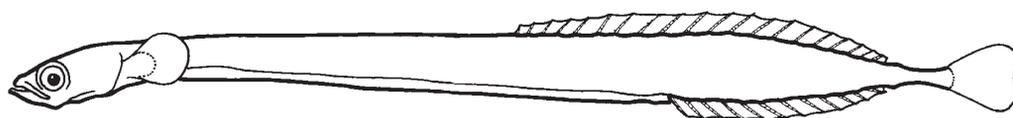
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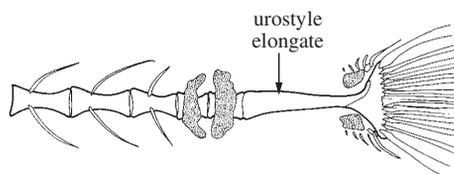
SCHINDLERIIDAE**Schindler's fishes**

by H.K. Larson

Diagnostic characters: Very small (to about 2.2 cm), slender gobioid fishes of **larval appearance**. Eye large, laterally placed, close to snout tip. Mouth small, oblique. Teeth very small, present only on premaxilla and dentary. Branchiostegal rays 5. Fin rays other than those in caudal fin simple (unbranched); **single dorsal fin with 15 to 22 soft rays**; anal fin with 10 to 18 soft rays; pectoral fins rounded, fan-like, with 11 to 18 rays; **pelvic fins absent**; caudal fin truncate, with 13 segmented rays. **Scales absent**. Vertebrae 12-24 + 13-21. Urostyle distinctive, elongate. Skeleton poorly ossified. **Colour:** transparent, sometimes with light pigmentation internally.

*Schindleria pietschmanni**Schindleria praematura*

Habitat, biology, and fisheries: Pelagic fishes, found off-shore or near coral reefs, often abundant. Of no commercial importance but could be taken incidentally during artisanal fisheries for larvae. One genus and 2 species known, both from the Indo-Pacific. The lightest known vertebrates. Of uncertain relationship among the suborder Gobioidaei.

**Similar families occurring in the area**

Easily confused with slender larvae of many bony fishes, especially clupeiforms and ammodytids, but can be distinguished by the unique elongate urostyle, 13 segmented caudal-fin rays, and in lacking pelvic fins.

List of species occurring in the area

Schindleria pietschmanni (Schindler, 1931)

Schindleria praematura (Schindler, 1930)

References

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Suborder KURTOIDEI

KURTIDAE

Nurseryfishes

by G.R. Allen

Diagnostic characters: Relatively elongate, oval-shaped, compressed, medium-sized (to about 36 cm) percoid fishes; longitudinal axis from tip of snout to middle of caudal fin passing through centre of eye; body tapers rapidly in posterior half. **Head humped and elevated, especially in males, which have a prominent protuberance or bony hook on forehead formed by skin covering the supraoccipital crest.** Eye moderate, shorter than snout length. Mouth large and protractile, with lower jaw slightly protruding; angle of jaw oblique, about 40° to horizontal; maxilla excluded from border of mouth. Bands of villiform teeth on jaws and smaller teeth on vomer and palatines. Branchiostegal rays 7. A single, **short-based dorsal fin with V to VII rudimentary spines at front followed by II well-developed spines and 12 to 14 soft rays;** anal fin with III spines (first is rudimentary) and 31 to 47 soft rays; pectoral fins with 17 to 19 rays; pelvic fins with I spine and 5 soft rays; caudal fin strongly forked. Scales very small and cycloid; head scaleless except for cheek and operculum. **Colour:** semi-transparent pinkish white, with silvery reflections on side of head and anterior part of body.



Habitat, biology, and fisheries: Mangrove shores, brackish estuaries, and lowermost sections of fresh-water streams, always in shallow depths. Always found in turbid water. The hooked forehead process of males is used to carry a grape-like cluster of large eggs during the breeding season. The eggs apparently remain in this position until hatching. Feeds on small fishes, prawns, and crayfish. Sometimes seen in markets and artisanal fisheries, particularly where mangroves are plentiful. Two species in the family, but only *Kurtus gulliveri* occurring in the area. It ranges through northern Australia and southern New Guinea.

Similar families occurring in the area

None. Their appearance is very distinctive (see combination of diagnostic characters in boldface).

A single species occurring in the area

Kurtus gulliveri Castelnau, 1878

Reference

Allen, G.R. 1991. *Field guide to the freshwater fishes of New Guinea*. Publication no. 9, Christensen Research Institute, Madang, Papua, New Guinea, 268 p.