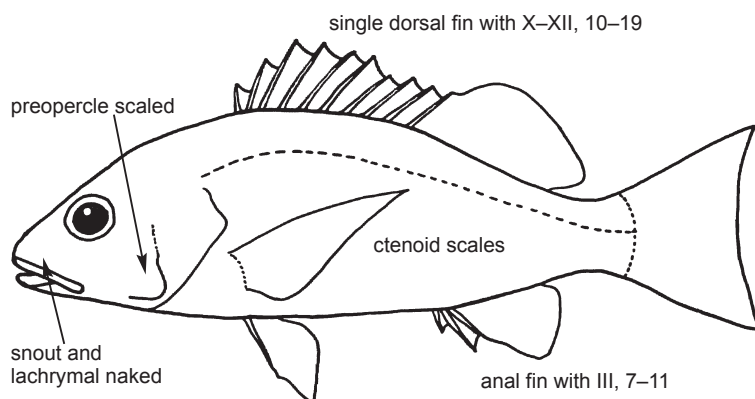


## LUTJANIDAE

### Snappers

Typical perch-like fishes, body symmetrical and moderately compressed, oblong in shape (size to 160 cm). Eye usually restrained; premaxilla usually moderately protrusible; mouth terminal and fairly large; maxilla upward for most or all of its length under lachrymal when mouth closed; supramaxilla absent. Jaws with conical teeth and usually with more or less distinct enlarged canines; teeth in jaws not fused together; pterygoids usually toothless; teeth typically well-developed on those bones; molar teeth absent in jaw; teeth in jaws not incisor-like, usually in several rows or a band; teeth in jaws variable-conical or molariform. Scales present on most part of head; cheek and operculum scaly; lips usually not fleshy; maxilla with or without scales; snout, lachrymal, and lower jaw naked; opercular spines 2; no chin pores. Dorsal fin single, continuous or slightly notched, spinous portion sometimes deeply incised posteriorly where it joins soft portion with X–XII spines and 10–19 soft rays; anal fin with III spines and 7–11 soft rays; pectoral-fin rays 14–19; pelvic fins with I spine and 5 soft rays, originating just behind pectoral-fin base. Caudal preduncle moderately long and high caudal fin shape variable frequently truncate, emarginated or lunate with 17 fin rays. Lateral line continuous without an abrupt bend. Pelvic axillary process usually well-developed. Gill membranes not united; preoper-



cular margin usually serrated with conical notch; branchiostegal rays 7. Vertebrae 24 (10 + 14).

**Color:** highly variable; mainly from red through yellow to blue; often with blotches, lines, or other patterns.

**Remarks:** Lutjanidae are found in tropical and subtropical areas of the Atlantic, Indian and Pacific Oceans. They are mainly marine inhabitants, although they are known to enter estuaries and freshwater. They are generally demersal swimmers, extending down to depths of about 500 m. Active predators, mostly nocturnal, feeding on crustaceans, mollusks, and fishes; while several are planktivores.

**Similar families occurring in the area:** Caesionidae – mouth small; premaxillae extremely protrusible; teeth small and minute; caudal fin deeply forked, with pointed lobes. Haemulidae – scales present on snout and

lachrymal, those in lachrymal often embedded; preoperculo mandibular canal lateral system opening under chin through median longitudinal groove or enlarged pores or both; usually no teeth on vomer and palatines; vertebrae 26 or 27. Lethrinidae – opercular membranes broadly united to each other; preopercular margin typically smooth; branchiostegal rays 6; soft rays in dorsal fin 9 or 10; no teeth on vomer or palatines; most species lack scales on cheek; lips frequently fleshy. Nemipteridae – preopercular margin typically smooth; soft rays in dorsal fin 9; soft rays in anal fin usually 7, rarely 8; branchiostegal rays 6; no teeth on vomer or palatines. Sparidae – preopercular margin typically smooth; branchiostegal rays 6; teeth in jaws variable, onical, incisiform, or molariform.

(S. Tafzilmeriam S. A. K.)

***Lutjanus lutjanus***  
(Bloch, 1790)

Bigeye Snapper

D X, 13; A III, 8; P<sub>1</sub> 15; P<sub>2</sub> I, 5; LLp 48–50; GR 6–8 + 17–19. Body fusiform, slender; its depth 2.9 to 3.3 times in standard length. Interorbital space flat and less than eye diameter. Head and body covered with small adhesive ctenoid scales. Scale rows on back rising obliquely above lateral line. Large terminal and slightly protractile mouth with thick lips. Vomerine tooth patch triangular, with a medial posterior extension. Preopercular margin finely denticulated, with preopercular notch. Lateral line running parallel to dorsal profile. Caudal fin truncate or slightly emarginated. **Color:** upper back golden brown; a broad yellow to brownish stripe from eye to caudal-fin base; yellow horizontal lines (1 per scale row) on lower half of body, and similar lines running obliquely above lateral line; fins yellowish. **Size:** maximum length about 30 cm. **Distribution:** widespread in the Indo-West Pacific. **Remarks:** inhabits offshore coral reefs and trawling grounds to depths of at least 90 m. Frequently seen in large schools (over 100 individuals). (S. Tafzilmeriam)



*Lutjanus lutjanus*, KAUM-I. 32826, 11.3 cm SL  
Gulf of Thailand (SP), 25 Oct. 2010



*Lutjanus madras*, KAUM-I. 33013, 12.3 cm SL  
Gulf of Thailand (SS), 3 Nov. 2010

***Lutjanus madras***  
(Valenciennes, 1831)

Indian Snapper

D X–XI, 13–14; A III, 8–9; P<sub>1</sub> 16–17; LLp 47–50; GR 6–7 + 12–15. Body fusiform, somewhat slender; its depth 2.6–3.1 in SL. Anterodorsal profile of head moderately to gently sloped; preorbital width about equal to 2/3 of eye diameter; preopercular notch and knob poorly developed.

Posterior profile of dorsal and anal fins angular; caudal fin truncate or slightly emarginate. Scale rows on back rising obliquely above lateral line. **Color:** upper back brownish; sides whitish with a series of fine yellow horizontal lines; fins yellow except pelvic fins frequently white or

faintly yellow. **Size:** maximum length about 30 cm, commonly to 20 cm. **Distribution:** Indian Ocean and West Pacific: Seychelles to New Guinea and the Philippines. **Remarks:** often misidentified as *L. lutjanus*.

(U. Satapoomin)



***Lutjanus malabaricus***  
(Bloch & Schneider, 1801)

Humpback Red Snapper

D X, 14; A III, 8; P<sub>1</sub> 17; P<sub>2</sub> I, 5; GR 25–30; LGR 15–20. Body deep, compressed, its depth 2.2–2.5 times in standard length. Preorbital bone broad, much wider than eye diameter, preopercular notch and knob well developed, vomerine tooth band lacking a medial posterior extension, tongue smooth, without teeth. Scale rows on back rising obliquely both above and below the lateral line. Caudal fin distinctly forked with rounded lobes. **Color:** body uniformly dark red in adults, darker on back and upper portion of head, an orange hue on lower part of opercle and in pectoral-fin axil, fins red or frequently dark brown to blackish, soft part of dorsal fin, anal and caudal fins with a narrow white margin, juveniles with a large round black spot at base of caudal fin. **Size:** maximum total length about 50 cm, commonly to 35 cm. **Distribution:** Indo-Pacific. **Remarks:** inhabits coral reefs. Depth distribution ranges from about 6 to at least 30 m.

(S. Tafzilmeriam)



*Lutjanus malabaricus*, KAUM-I, 33134, 10.3 cm SL  
off Chantha Buri (SP), 22 Nov. 2010

***Lutjanus russellii***  
(Bleeker, 1849)

Russell's Snapper

D X, 14; A III, 8; P<sub>1</sub> 15; P<sub>2</sub> I, 5; LLp 47–50; GR 6–7 + 7–11. Body moderately deep, elongated and compressed, its depth 2.6–2.8 in standard length. Anterodorsal profile of head steeply to moderately sloped; preorbital width about equal to, or slightly less than eye diameter. Body covered with small, adhesive, ctenoid scales. Dorsal and anterior part of head scaleless. Scale rows on back rising obliquely above lateral line. Large, terminal and slightly protractile mouth with thick lips. Preopercular notch and knob poorly developed. Caudal fin truncate or slightly emarginate. **Color:** body reddish-brown; a black spot, sometimes faint, on the lateral line below the anterior portion of the soft dorsal fin; adults from Malaysia usually with 6 dark yellow stripes on sides; juveniles,



*Lutjanus russellii*, KAUM-I, 32952, 12.6 cm SL  
Rayong, 31 Oct. 2010

whitish with 4 black stripes on sides and with a round black spot on upper back. **Size:** maximum length about 45 cm, commonly to 26 cm. **Distribution:** Western Pacific. **Remarks:** in-

habits inshore rocky and coral reefs; to a depth of 80 m. Juveniles often found in mangrove areas. (S. Tafzilmeriam)

***Lutjanus sebae***  
(Cuvier, 1816)

Emperor Red Snapper

D XI, 15–17; A III, 10; P<sub>1</sub> 17; P<sub>2</sub> I, 5; LLp 46–49; GR 6–7 + 10–12. Body deep. Soft portions of dorsal and anal fins pointed. Vomerine tooth patch crescentic or triangular, without a medial posterior extension. Caudal fin slightly forked. **Color:** body white with 3 red bands on lateral surface of body; 1st band from snout to origin of 1st dorsal fin spine; 2nd band from base of pelvic fin to middle of dorsal-fin spines; 3rd band from lower edge of caudal fin to origin of last dorsal-fin spine. Upper part of caudal-fin lobe red. Pelvic fins dark red. **Size:** maximum length to at least 100 cm. **Distribution:** widely in Indo-West Pacific, east coast of Africa to Australia. **Remarks:** occurs in coral and rocky reefs.

(T. Yoshida)



*Lutjanus sebae*, KAUM-I. 23087, 12.1 cm SL  
Gulf of Thailand (SS), 6 Sept. 2009

***Lutjanus vitta***  
(Quoy & Gaimard, 1824)

Brownstripe Redsnapper

D X, 13; A III, 8; P<sub>1</sub> 15; P<sub>2</sub> I, 5; LLp 49–51; GR 6–7 + 9–12. Body moderately deep to relatively slender; its depth 2.6 to 3 times in standard length. Preorbital width about equal to eye diameter; preopercular notch and knob poorly developed. Scales present on cheek, preoperculum and operculum. Head and body covered with small, ctenoid scales. Soft-rays of dorsal and anal fins with scaly sheath. Scale rows on back rising obliquely above lateral line. Large, terminal and slightly protractile mouth with thick lips. Preopercular margin finely serrated with preopercular notch. Caudal fin emarginated. **Color:** dorsal region of body yellowish with a dark brown to blackish stripe on the middle of the side from eye to upper half of caudal



*Lutjanus vitta*, KAUM-I. 32966, 15.7 cm SL  
off Chantha Buri (SP), 1 Nov. 2010

peduncle. A longitudinal dark stripe originating behind eye and ends at upper base of caudal fin. Fins yellowish except pelvic fin. **Size:** maximum length about 31 cm, juvenile with

lengths of 16 to 24 cm. **Distribution:** Indo-West Pacific. **Remarks:** inhabits vicinity of coral reefs.

(S. Tafzilmeriam)

***Pinjalo pinjalo***  
**(Bleeker, 1850)**

**Pinjalo**

D XI 14–15; A III, 9–10; P<sub>1</sub> 17–19; LLp 48–51; GR 6–8 + 16–18. Body moderately deep, laterally compressed. Dorsal profile of head convex. Dorsal fin continuous without a notch between spinous and soft portions. Eye large, about equal to snout length. Caudal fin deeply emarginated. **Color:** head and dorsal half of trunk reddish pink to yellowish pink; opercle and lower half of trunk silvery white; pectoral fin pink; dorsal, pelvic, anal and caudal fins yellowish. **Size:** maximum standard length 46 cm. **Distribution:** widely distributed in the Indo-West Pacific. **Remarks:** inhabits offshore coral reefs and rocky bottoms. Marketed fresh or dried-salted.

(T. Yoshida)



*Pinjalo pinjalo*, KAUM-I. 23794, 12.6 cm SL  
 Gulf of Thailand (SS), 25 Sept. 2009

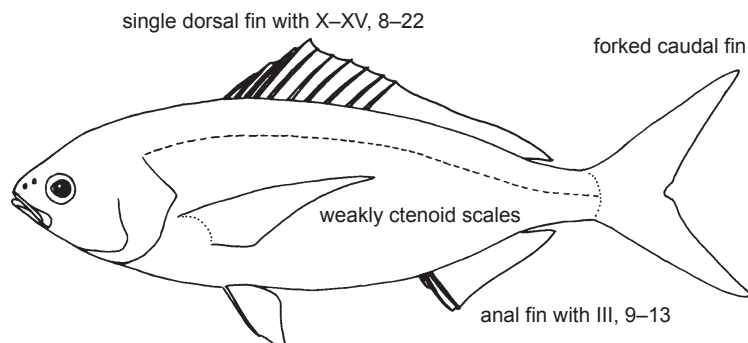


## CAESIONIDAE

### Fusiliers

Medium sized (up to 50 cm) marine fishes. Body oblong to fusiform, moderately compressed; longitudinal axis from tip of snout to middle of caudal fin passing through center of eye. Eye moderately large, its diameter longer than snout length. Mouth small and highly protrusible. Dentition variously reduced; small or minute conical teeth; premaxilla, vomer, and palatines with or without teeth. Dorsal fin with X–XV slender weak spines and 8–22 soft rays; anal fin with III spines and 9–13 soft rays; pelvic fin with I spine and 5 soft rays; pectoral fin with 16–24 rays; caudal fin distinctly forked, with pointed lobes. Branchiostegal rays 7. Scales moderate to small, weakly ctenoid; lateral line scales 45–88; scale rows on body running horizontally; dorsal and anal fins with scales in most species. **Color:** sides with or without longitudinal stripes; caudal fin either without markings, with blackish blotch on tips of lobes, or with a longitudinal blackish streak in middle of each lobe; axil of pectoral fins black.

**Remarks:** found mostly on coral reefs; occur near the surface to



depths of 60 m. Feed by picking zooplankton. Major importance in coral-reef fisheries.

**Similar families occurring in the area:** Lutjanidae – closely allied to Caesionidae and difficult to distinguish from Caesionidae on the basis of any single external character, but most members of Lutjanidae having a deeper body, the eye well above the horizontal axis of the body, and lacking a strongly forked caudal fin; those lutjanid genera with the horizontal passing near the center of eye either having scale rows running obliquely upward, fewer than 9 anal fin rays, no

scales on dorsal and anal fins, or the caudal fin much less deeply forked. Nemipteridae – eye above horizontal axis in most species; 9 dorsal and 7 or 8 anal fins soft rays. Lethrinidae – eye always above horizontal axis of body; base of soft part of dorsal fin generally shorter than base of spinous part; 8–10 anal fin soft rays; usually enlarged canines in front of jaws, sometimes lateral molars. Emmelichthyidae – superficially similar but caught in deep water; maxilla fully scaly; dorsal fin with IX spines and usually 12 soft rays.

(M. Matsunuma)

### *Caesio caerulaurea* Lacepède, 1801

#### Blue-and-gold Fusilier

D X, 14–16; A III, 12–13; P<sub>1</sub> 19–22; LLp 57–65. Body fusiform and elongate. A single postmaxillary process; small conical teeth on jaws, vomer, and palatines. Scale rows above lateral line 8–10; dorsal and anal fins scaly; the scale rows on spinous part of dorsal fin horizontal; supratemporal band of scales often interrupted at dorsal midline by a V-shaped scaleless zone; 3–5 scales on cheek; 22–25 predorsal scales. **Color:** upper body bluish, lower body white to pale bluish; a single yellow stripe from above the eye, running along the body and above lateral line, to upper caudal peduncle. **Size:** maximum length about 35 cm. **Distri-**



*Caesio caerulaurea*, KAUM-I. 23422, 16.2 cm SL  
Gulf of Thailand (SS), 24 Sept. 2009

**bution:** Indo-West Pacific. **Remarks:** inhabits coastal areas, primarily around coral reefs to depths of around 40 m.

(U. Satapoomin)

***Caesio cuning*  
(Bloch, 1791)**

Redbelly Yellowtail Fusilier

D X, 14–16; A III, 10–12; P<sub>1</sub> 17–20; LL 45–51. Body fairly deep and compressed. A single postmaxillary process; small conical teeth in jaws, vomer and palatines. Scale rows above lateral line 7–9; supratemporal band of scales confluent at dorsal midline; 4–5 scales on cheek; predorsal scales 20–26; dorsal and anal fins scaly, the dorsal fin with about 1/2 of its greatest spinous height covered with scales; supratemporal band of scales confluent at dorsal midline. **Color:** head and body bluish white, pinkish ventrally; posterior portion of back, upper caudal peduncle, and caudal fin yellow; axil and upper base of pectoral fin black; dorsal fin yellow posteriorly and grayish blue anteriorly; pelvic and anal fins reddish. **Size:** maximum length 50 cm. **Distribution:** Indo-West Pacific. **Remarks:** inhabits coastal areas to the depth of 60 m.

(M. Matsunuma)



*Caesio cuning*, KAUM-I. 47439, 15.3 cm SL  
off Tha Chana (SP), 18 June 2012



*Dipterygonotus balteatus*, KAUM-I. 33004, 7.6 cm SL  
Gulf of Thailand (SS), 3 Nov. 2010

***Dipterygonotus balteatus*  
(Valenciennes, 1830)**

Mottled Fusilier

D XII–XV, 8–11; A III, 9–11; P<sub>1</sub> 17–19; LL 68–80. Body slender, fusiform, elongate, and moderately compressed. Two postmaxillary processes; small conical teeth on dentary and vomer; premaxilla and palatines without teeth. Scales above lateral line to origin of dorsal fin 9–11; scales below lateral line to origin of anal fin 15–18; usually 6–9 scale rows on cheek; predorsal scales usually 29–34; dorsal and anal fins without scales. **Color:** body brownish bronze dorsally, silvery white ventrally; with a thin, straight, tan stripe about 1 scale wide from orbit to caudal fin, above lateral line; above and parallel to this stripe 2 thin, irregular, and usually interrupted stripes of same color; caudal fin tan to pinkish. **Size:** maximum length 14 cm. **Distribution:** Indo-West Pacific. **Remarks:** feeds on zooplankton. Marketed fresh.

(M. Matsunuma)

***Pterocaesio chrysozona*  
(Cuvier, 1830)**

Goldband Fusilier



*Pterocaesio chrysozona*, KAUM-I. 32973, 9.2 cm SL  
off Chantha Buri (SP), 1 Nov. 2010

D X–XI, 14–16; A III, 11–12; P<sub>1</sub> 17–20; LL 64–69. Body fusiform, elongate, and moderately compressed. Two postmaxillary processes; small conical teeth in jaws, vomer, and palatines. Scales above lateral line to origin of dorsal fin 7–9; scales below lateral line to origin of anal fin 14–16; predorsal scales usually 23–26; dorsal and anal fins scaly, dorsal fin with about 1/2 of its greatest spinous height covered with scales. **Color:** body light blue to brownish dorsally, white to

pinkish ventrally; a bright yellow band directly below lateral line for most of its length, from behind eye to base of caudal fin, 2 to 3 scales wide anteriorly, tapering to 1 scale in width on caudal peduncle where it is above lateral line; a less conspicuous yellow stripe along dorsal midline; dorsal fin slightly dusky distally; tips of caudal-fin lobes black. **Size:** maximum length 21 cm. **Distribution:** Indo-West Pacific. **Remarks:** schooling fish found in coral reefs.

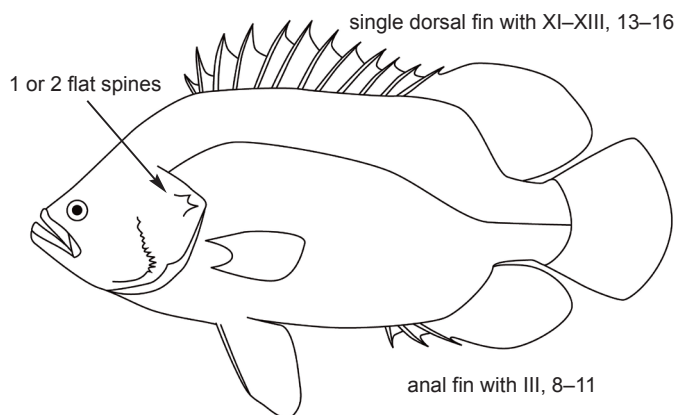
(M. Matsunuma)



## LOBOTIDAE

### Tripletails

Moderately deep bodied and compressed (size to over 1 m). Head length shorter than body depth; profile of head from eye, generally concave. Preopercle finely to coarsely serrate; opercle with 1 or 2 flat spines. Mouth terminal to slightly superior, extending to anterior or middle portion of eye; in jaws, an outer row and an inner band of smaller teeth; roof of mouth without teeth. Single dorsal fin with XI to XIII spines and 13 to 16 soft rays. Anal fin with III spines and 8 to 11 soft rays, soft-rayed portion of second dorsal and anal fin broadly rounded and extending beyond base of caudal fin, resulting in the appearance of a single 3-lobed fin. Scales ctenoid, 42 to 70 in lateral line. **Color:** yellowish, brownish, greenish and/or sometimes mottled, or whitish with 4 to 10 dark brownish bars.



**Remarks:** coastal and estuarine, some entering fresh water; some associated with floating objects well out to sea. Carnivorous.

**Similar families occurring in the area:** Serranidae – 3 flat spines on upper part of opercle. Haemulidae

– presence of chin pores. Lutjanidae – truncate, emarginate, or forked caudal fin, the usual absence of an enlarged second dorsal-fin spine and teeth usually present on vomer and palatines.

(S. Tafzilmeriam S. A. K.)

### *Lobotes surinamensis* (Bloch, 1790)

#### Tripletail

D XII, 15–16; A III, 11; P<sub>1</sub> 15; P<sub>2</sub> I, 5; LLp 51–52. A compressed, deep-bodied perch-like fish with the dorsal and anal fins rounded and symmetrical with the tail appearing as a single three-lobed fin. Interorbital space narrow, profile head concave; eye relatively small; no subocular shelf visible externally; mouth large, slightly oblique, upper jaw protractile; maxilla not slipping under preorbital bone when mouth closed; no teeth on roof of mouth; preopercle with strong denticles along its margin. Pectoral fins shorter than pelvic fins. **Color:** body yellowish, brownish to greenish gray. Dorsal, caudal, anal and pelvic fins with an orange, dark brown and greenish gray stripe. Pectoral fin yellow. The young are often bright yellowish, becoming darker with age. **Size:** maximum to 110 cm; common to 50 cm;



*Lobotes surinamensis*, KAUM-I. 47379, 17.8 cm SL  
Gulf of Thailand (SS), 13 June 2012

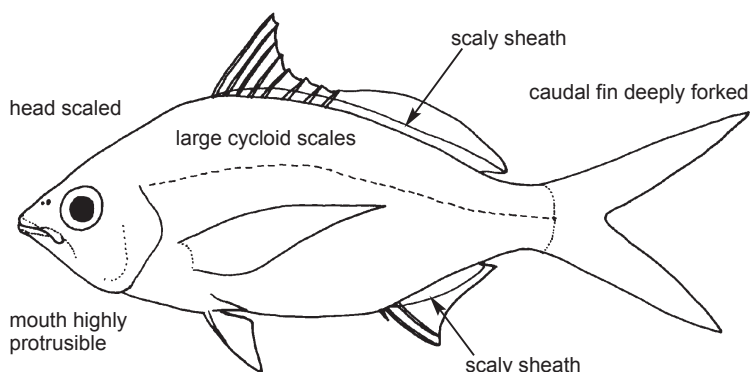
world game record 19.2 kg. **Distribution:** throughout the Western Central Atlantic. **Remarks:** in littoral zone of all warm seas. (S. Tafzilmeriam)

## GERREIDAE

### Mojarra

Small to medium sized marine and brackish fishes; maximum size about 40 cm. Body compressed, depth variable, oblong to rhomboidal. Head scaled; mouth small, highly protrusible; teeth on jaws small, brush-like; gill membrane free from isthmus. A single dorsal fin, lacking a distinct notch, with IX–X spines and 9–17 soft rays; anal fin usually with II–IV spines and 6–18 soft rays; scaly sheath along bases of dorsal and anal fins; pelvic fin I, 5; caudal fin deeply forked. Scales thin, cycloid, moderately large, but deciduous. Vertebral counts 24. **Color:** body generally brilliant silver, with dark vertical bars or spots on body in some species.

**Remarks:** occurring in tropical to temperate marine and estuarine areas. Feed mainly on benthic animals.



**Similar families occurring in the area:** Gerreidae is distinguished from the following similar families in having strongly protrusible mouth, scaled head, moderately large cycloid

scales on body, and scaly sheath along the bases of dorsal and anal fins. Haemulidae, Lutjanidae, and Sparidae – mouth not highly protrusible. (S. Kimura)

### *Gerres chrysops*

Iwatsuki, Kimura & Yoshino, 1999

Gold sheen Silverbiddy

D IX, 10 (rarely X, 9); A III, 7; P<sub>1</sub> 16; LLp 33–36; GR 4–6 + 7–8. Body deep, compressed, anterodorsal profile sharply ascending. Posterior tip of maxilla reaching almost to below anterior margin of pupil. Second dorsal-fin spine not elongated; pectoral fins reaching beyond anus, to just before level of anal fin origin. Scales moderately deciduous, 3–4 scales between base of fifth dorsal-fin spine and lateral line. **Color:** body brilliant gold above, silvery white below; all fins yellow; lower tip of caudal fin white. **Size:** maximum length 8.3 cm SL. **Distribution:** restrictedly found in the Gulf of Thailand. **Remarks:** very common fish around the northern Gulf of Thailand. (S. Kimura)



*Gerres chrysops*, KAUM-I. 32696, 7.4 cm SL  
Gulf of Thailand (SS), 22 Oct. 2010

***Gerres erythrouros***  
(Bloch, 1791)

Deepbody Silverbiddy

D IX, 10; A III, 7; P<sub>1</sub> 15–16; LL 35–38; GR 4–5 + 8–9. Body deep, compressed; anterodorsal profile almost straight. Dorsal- and anal-fin spines strong; second dorsal-fin spine longer than the third; second anal-fin spine robust, nearly the same in length of anal-fin base; caudal fin short, deeply forked, tips broadly rounded. **Color:** body brownish silver dorsally, brilliant silver ventrally, with indistinct dark longitudinal stripes along scale rows above and 4–6 rows immediately below lateral line; often 4–11 indistinct vertical narrow dark bars on side of body; anal and pelvic fins yellow. **Size:** maximum length about 37 cm. **Distribution:** Indo-Pacific, from western India to Micronesia. **Remarks:** inhabits soft bottom. Juveniles often observed in estuarine waters. Caught by bottom set nets and bottom trawls. Marketed fresh or dried and salted.

(S. Kimura & S. Tafzilmeriam)



*Gerres erythrouros*, KAUM-I. 47421, 9.7 cm SL  
Ang Sila, 15 June 2012

***Gerres filamentosus***  
Cuvier, 1829

Whipfin Mojarra

D IX, 10; A III, 7; P<sub>1</sub> 15–16; LL 43–46 (usually 44–45); GR 4–6 + 8. Body deep, compressed, anterodorsal profile somewhat convex. Second dorsal-fin spine very long and filamentous, reaching slightly beyond base of last dorsal-fin ray; anal-fin spines generally robust, third longest; caudal fin deeply forked, lobes pointed. Preopercle with 3 scale rows; 4 ½–5 ½ scales between 5th dorsal fin spine base and lateral line. **Color:** body brownish silver dorsally, brilliant silver ventrally, with vertical rows of indistinct dark ovoid spots laterally in adults and subadults; all fins tinged with tan, caudal fin with a blackish margin. **Size:** maximum length about 32 cm. **Distribution:** widely distributed in tropical Indo-Pacific, from eastern coast of Africa to Micronesia. **Remarks:** inhabits sandy or muddy bottoms in



*Gerres filamentosus*, KAUM-I. 32735, 14.7 cm SL  
Gulf of Thailand (SS), 22 Oct. 2010

coastal areas to depths of at least 50 m. Marketed fresh or dried, sometime used in making fish crackers. Caught mainly by beach seines and bottom trawls. (S. Kimura & S. Tafzilmeriam)



***Gerres macracanthus*  
Bleeker, 1854**

Longspined Silverbiddy

D IX, 10; A III, 7; P<sub>1</sub> 15; LLp 41–44. Body relatively slender and compressed. Usually 4 ½ scale rows between 5th dorsal-fin spine base and lateral line; 5 ½ or 6 ½ scales above lateral line, 9 ½ or 10 ½ scales below. Second dorsal-fin spine elongated and filament; 2nd and 3rd anal-fin spines short. Caudal fin deeply forked. **Color:** body silvery with usually 6–10 (rarely up to 14 as faint bands in larger specimens) indistinct vertical dark bands on body; pectoral, pelvic, and anal fins yellowish. **Size:** maximum total length 20 cm. **Distribution:** Indo-West Pacific. **Remarks:** found in coastal waters to depths of at least 30 m. (S. Tafzilmeriam)



*Gerres macracanthus*, KAUM-I. 22985, 8.4 cm SL  
Gulf of Thailand (SS), 3 Sept. 2009

***Gerres oyena*  
(Forsskål, 1775)**

Common Silverbiddy

D IX, 10; A III, 7; P<sub>1</sub> 15–17; LL 35–40; GR 3–6 + 8–9 (usually 8). Body oblong, compressed, anterodorsal profile convex. Posterior tip of maxilla extending beyond anterior margin of eye. Second dorsal-fin spine not elongated; pectoral fins short, not reaching to anal-fin origin. Scales mostly absent on premaxillary groove; scale rows above lateral line 4. **Color:** body silvery, sometime with faint dark vertical bands laterally; tip of dorsal and caudal fins with black margins; a row of small dusky spots on dorsal-fin membrane near base; anal and pelvic fins yellowish. **Size:** maximum length about 25 cm. **Distribution:** Indo-Pacific. **Remarks:** inhabits inshore, especially soft bottom area at depths shallower than 30 m.

(S. Kimura & S. Tafzilmeriam)



*Gerres oyena*, KAUM-I. 32733, 12.5 cm SL  
Gulf of Thailand (SS), 22 Oct. 2010

***Pentaprion longimanus*  
(Cantor, 1849)**

Longfin Silverbiddy

D IX–X, 14–15; A V–VI, 12–13; P<sub>1</sub> 17; LLp 44–48; GR 6 + 12–13. Body oblong, compressed; dorsal and ventral profiles almost equally convex. Posterior tip of maxilla reaching almost to below anterior margin of eye. Second dorsal-fin spine not elongated; anal-fin base longer than base of soft



*Pentaprion longimanus*, KAUM-I. 47436, 9.0 cm SL  
off Tha Chana (SP), 18 June 2012

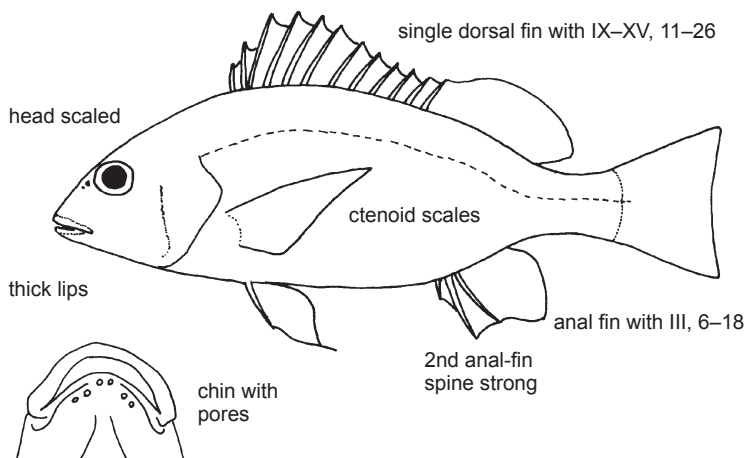
portion of dorsal fin; caudal fin deeply forked. Scales deciduous. **Color:** body silvery, pale brown dorsally; all fins whitish; caudal fin tinged with yellow. A longitudinal silvery band along lateral mid-line of head and body. **Size:** maximum length about 20

cm. **Distribution:** Indo-West Pacific from western India to Papua New Guinea, north to Okinawa, Japan, south to northern Australia. **Remarks:** inhabits inshore areas, on muddy-sand bottoms. Feeds on small benthic invertebrates. (S. Kimura)

## HAEMULIDAE

### Sweetlips (Grunts)

Medium-sized (up to 120 cm), oblong and compressed fishes. Lateral line continuous. Head almost entirely scaled, exclusive of lips, chin and tip of snout; mouth small or moderate in size, subterminal; lips thick in *Plectorhinchus*; chin with distinct pores; hind margin of lachrymal not exposed; opercle with a single spine; teeth conical, forming narrow band in each jaw; teeth on outermost row of jaws enlarged, but not canine-like; palatine toothless; branchiostegals 7. A single dorsal fin with IX–XV strong spines (second spine usually very strong) and 11–26 soft rays; anal fin with III spines and 6–18 soft rays; pelvic fin below base of pectoral fin, with I spine and 5 soft rays; caudal fin truncate or emarginate in adults, rounded in juveniles. Scales small and ctenoid. Vertebrae 26–27. **Color:** highly variable, appearing characteristic pattern (e.g., banded and spotted) in each species; in many species, juveniles strikingly differ from adult in color.



**Remarks:** inhabit coastal waters including reefs, bays, and estuaries, down to about 80 m. Carnivorous, feed on small benthic invertebrates or fishes. Esteemed as food fish, caught by spear, line, and various nets; marketed fresh or salted.

**Similar families occurring in the area:** Lutjanidae – suborbital area

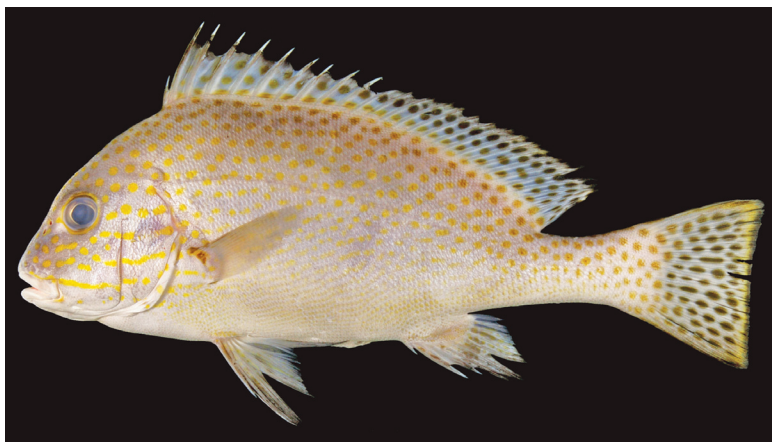
naked; palatine usually toothed. Lethrinidae – no scales on preopercle; dorsal fin with 9–10 soft rays. Nemipteridae – no pores on chin; hind margin of lachrymal exposed. Sparidae – suborbital area naked; preopercular margin not serrated.

(H. Motomura & K. Shibukawa)

#### *Diagramma picta picta* (Thunberg, 1792)

##### Yellow-spotted Slatey

D IX–X, 20–26; A III, 7; P<sub>1</sub> 16–18; LLp 55–74; GR 17–23. Body deep and compressed. Profile of snout steep; lips fleshy; chin with six pores; lower jaw without longitudinal groove at midline. **Color:** varying much by size; large adult silvery gray, with or without dusky spots; subadult pale gray with numerous bright yellow or dusky spots or lines on head, body and fins; juvenile with broad longitudinal black bands on body. **Size:** commonly 45 cm, maximum 100 cm. **Distribution:** Indo-West Pacific. **Remarks:** inhabits rocky and coral reefs and sandy bottoms. Nocturnal, forming small aggregations by day and dispersing at night for feeding; feeds on small benthic invertebrates. Johnson et al. (2001) regarded it as a valid subspecies. (K. Shibukawa)



*Diagramma picta picta*, KAUM-I. 32802, 22.2 cm SL  
Gulf of Thailand (SP), 25 Oct. 2010



***Plectorhinchus gibbosus***  
(Lacepède, 1802)

Harlequin Sweetlip

D XIII–XIV, 15–17; A III, 7–8; P<sub>1</sub> 16–18; P<sub>2</sub> I, 5; LLp 46–55; GR 8–10 + 18–20. Body deep, compressed. Lip fleshy, greatly swollen with age. Chin with 6 pores; no median pit; not covering barbels or papillae. Caudal fin rounded in juveniles, rounded to truncate in adults. **Color:** body dark gray. Centers of scales paler than edges. No distinct spots or blotches on fins. **Size:** maximum about 75 cm. **Distribution:** widely distributed in the Indo-West Pacific, from South Africa east to the Samoa Islands, and southern Japan south to New South Wales, Australia. **Remarks:** generally found in silty reef areas, young penetrating estuarine habitats. (H. Motomura)

***Pomadasys argenteus***  
(Forsskal, 1775)

Silver Grunt

D XII, 13–14; A III, 7; P<sub>1</sub> 16–18; P<sub>2</sub> I, 5; LLp 47–49. Body deep, compressed; head blunt. Lip fleshy, greatly swollen with age. Chin with 2 pores and a median pit. Circumpeduncular scales 21 or 22; 5 scales between lateral line and dorsal-fin origin. Caudal fin emarginate. **Color:** in adults, body silvery with dark blotches on dorsal fin and numerous scattered dark brown to blackish spots on body side. Juveniles with body pale brownish, lighter below, back with irregular longitudinal streaks on alternate scale rows; dorsal fin with dusky membranes; a dark spot on gill cover. **Size:** commonly 40 cm, maximum 60 cm. **Distribution:** Indo-West Pacific from the Red Sea to Melanesia, northern Australia north to southern Japan. **Remarks:** found in coastal inshore waters in open bays and estuaries. Marketed fresh. (M. Matsunuma)

***Pomadasys maculatus***  
(Bloch, 1793)

Saddle Grunt

D XII, 13–14; A III, 7; P<sub>1</sub> 17; P<sub>2</sub> I, 5; LLp 50–52; GR 5–6 + 13–15. Body moderately elongate, compressed. Chin with two pores and a median pit. Posterior portion of maxilla slightly covered or not covered by lacrimal laterally in western Pacific population; largely covered by lacrimal in Indian



*Plectorhinchus gibbosus*, KAUM–I. 32864, 18.8 cm SL  
Gulf of Thailand (SS), 27 Oct. 2010



*Pomadasys argenteus*, KAUM–I. 33218, 19.4 cm SL  
off Chantha Buri (SP), 30 Nov. 2010



*Pomadasys maculatus*, KAUM–I. 23872, 13.9 cm SL  
Gulf of Thailand (SS), 26 Sept. 2009

Ocean population. Caudal fin slightly emarginate. **Color:** body silver with a large black blotch across nape, extending downward to below lateral line; three broken black blotches on upper half of trunk. A large dark blotch on membrane centrally between second

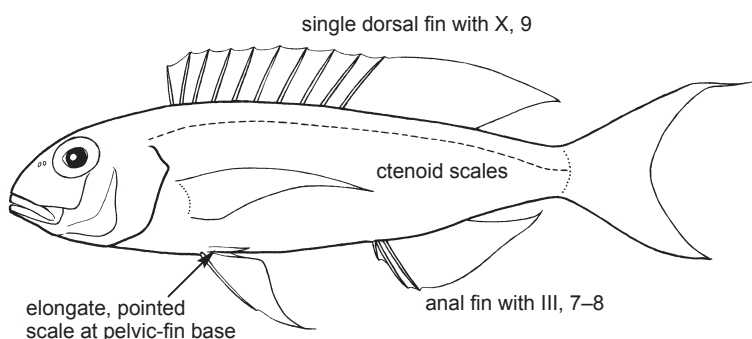
and seventh dorsal-fin spines. **Size:** maximum length 59.3 cm. **Distribution:** Indo-West Pacific. **Remarks:** occurs in coastal inshore waters in open bay and estuaries to depths of less than 110 m. (H. Motomura)

## NEMIPTERIDAE

### Threadfin Breams and Monocle Bream

Medium sized (up to 35 cm), moderately elongate fishes. Head compressed; eyes moderately large; jaws subequal, or upper jaw slightly beyond lower jaw; hind margin of suborbital bone exposed; branchiostegal rays 6. Single dorsal fin with X spines and 9 soft rays; anal fin with III spines and 7–8 soft rays; pectoral fin more or less falcate, with 14–19 soft rays (uppermost 2 rays unbranched); pelvic fin with I spine and 5 soft rays; caudal fin emarginated, lunate or forked, with filamentous tip on each or both lobes in many species. Scales ctenoid; cheek and operculum scaled; a pair of elongate, pointed scales at base of pelvic fin. **Color:** pinkish, yellowish, grayish, or brownish dorsally, turned to silvery ventrally, with various-colored vertical bands or longitudinal stripes on head and body in many species.

**Remarks:** found in coral reefs and coastal to offshore shelf waters



with sandy or muddy bottoms, down to about 300 m depth. Carnivorous, feed on small fishes, crustaceans, cephalopods, and polychaetes. Esteemed as food fish in many species; marketed fresh, dried and salted, or minced for fish balls or fish cakes.

**Similar families occurring in the area:** Caesionidae – dorsal fin with X–XV spines and 8–22 soft rays; anal fin with III spines and 9–13 soft rays;

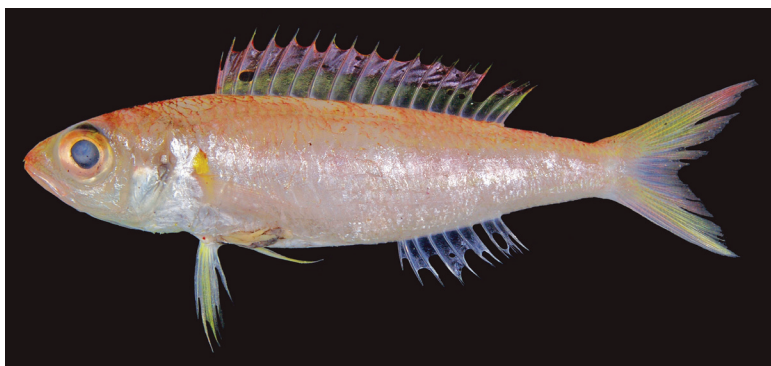
no elongated, pointed scales at base of pelvic fin. Haemulidae – dorsal fin with IX–XIV spines and 11–26 soft rays. Lethrinidae – anal fin with III spines and 8–10 soft rays; no scales on preopercle in *Lethrinus* (scaly in other genera). Lutjanidae – no elongate and pointed scales at base of pelvic fin.

(K. Shibukawa & H. Motomura)

#### *Nemipterus balinenoides* (Popta, 1918)

##### Dwarf Threadfin Bream

D X, 9; A III, 7; P<sub>2</sub> I, 5; GR 15–17. Body elongate, compressed; body depth 3.8–4.4 in SL. Posterior margin of suborbital and lower preopercular margin not serrated; suborbital spine absent. Suborbital depth 4.1–6.7 in eye diameter. Ventral margin of orbit extending below a horizontal line through snout tip and upper base of pectoral fin. First 2 dorsal-fin spine separated by a membrane; membranes between dorsal-fin spines not strongly incised. Upper lobe of caudal fin not filamentous. Pectoral fin not reaching a vertical through anus. Three transverse scale rows on preopercle. **Color:** body pinkish dorsally, silvery ventrally. A distinct yellow spot above upper pectoral-fin base. Dorsal fin pinkish to yellowish, with greenish-yellow to purple margin. Anal fin



*Nemipterus balinenoides*, KAUM-I. 23277, 7.9 cm SL  
Gulf of Thailand (SS), 10 Sept. 2009

translucent white. Pelvic fins pale yellow. Caudal fin pale yellowish-pink; tip of upper lobe purple. **Size:** maximum standard length 12.5 cm. **Distribution:** western Pacific, including Thailand, Indonesia, Philippines, and New Caledonia. **Remarks:** usually occurs on sandy or muddy bottoms at depths of 30 to 80 m. (H. Motomura)

*Nemipterus furcosus*  
(Valenciennes, 1830)

Forktailed Threadfin Bream

D X, 9; A III, 7; P<sub>1</sub> 16–18; P<sub>2</sub> I, 5; GR 7–10. Body moderately elongate, compressed; body depth 3–3.9 in SL. Snout length equal to or greater than eye diameter. Suborbital spine absent; 4–6 transverse scale rows on preopercle. Ventral margin of orbit tangent to or above just reaching or not reaching a horizontal line through snout tip and upper base of pectoral fin. Pectoral fin reaching to or just short of a vertical through anus; pelvic fins short, reaching to or short of a vertical through anus; caudal fin deeply forked; upper lobe of the fin pointed, not produced. **Color:** body pinkish dorsally, silvery ventrally. Nine indistinct reddish saddle bars on back; forming a reddish spot behind origin of lateral line. Dorsal fin



*Nemipterus furcosus*, KAUM-I. 32989, 13.2 cm SL  
Gulf of Thailand (SS), 3 Nov. 2010

pale rosy, sometimes with yellowish tinge, outer margin darker pink; a yellow stripe submarginally. Anal fin bluish white, with row of transparent or faint yellowish spots near base. Caudal fin pale rosy, with yellow tinge; lower

margin of fin white; posterior tip of upper lobe red. **Size:** maximum length 20 cm SL. **Distribution:** eastern Indian Ocean and West Pacific. **Remarks:** occurs on sand and mud bottoms in depths of 8–110 m. (M. Matsunuma)

*Nemipterus hexodon*  
(Quoy & Gaimard, 1824)

Ornate Threadfin Bream

D X, 9; A III, 7; P<sub>1</sub> 15–18; P<sub>2</sub> I, 5; GR 11–17. Body moderately elongate, compressed. Posterior margin of suborbital and lower preopercular margin not serrated; suborbital spine absent. Ventral margin of orbit not reaching a horizontal line through snout tip and upper base of pectoral fin. Enlarged canines anteriorly in upper and lower jaws. First 2 dorsal-fin spines separated by a membrane. Upper lobe of caudal fin slightly rounded. Pectoral fin not extending beyond a vertical through anal fin origin. Three transverse scale rows on preopercle. **Color:** body pinkish dorsally, silvery ventrally, with 6–8 pale yellow stripes below lateral line. A red, ovoid spot below lateral line origin, bordered below by bright yellow. **Size:** maximum length 21 cm SL. **Distribution:** the Andaman Sea and West Pacific. **Remarks:** usually occurs on sandy or muddy bottoms at depths of 10 to 80 m. (H. Motomura)



*Nemipterus hexodon*, KAUM-I. 33116, 14.0 cm SL  
Gulf of Thailand (SS), 18 Nov. 2010



***Nemipterus marginatus***  
(Valenciennes, 1830)

Red Filament Threadfin Bream

D X, 9; A III, 7; P<sub>1</sub> 16; P<sub>2</sub> I, 5; GR 12. Body moderately elongate, compressed. Posterior margin of suborbital and lower preopercular margin not serrated; suborbital spine absent. Ventral margin of orbit above a horizontal line through snout tip and upper base of pectoral fin. Pectoral and pelvic fins long; caudal fin forked, upper lobe produced into a short filament. Three transverse scale rows on preopercle.

**Color:** body pinkish dorsally, silvery ventrally; with a broad yellow stripe, divided above pectoral fin, from below lateral line origin to upper part of caudal peduncle; a second yellowish-orange stripe from above base of pectoral fin to lower part of caudal pe-



*Nemipterus marginatus*, KAUM-I. 33051, 10.0 cm SL  
Prachuap Khiri Khan, 9 Nov. 2010

duncle; a reddish spot below and just behind lateral line origin; caudal fin including filament, reddish, its median rays yellowish. **Size:** maximum length

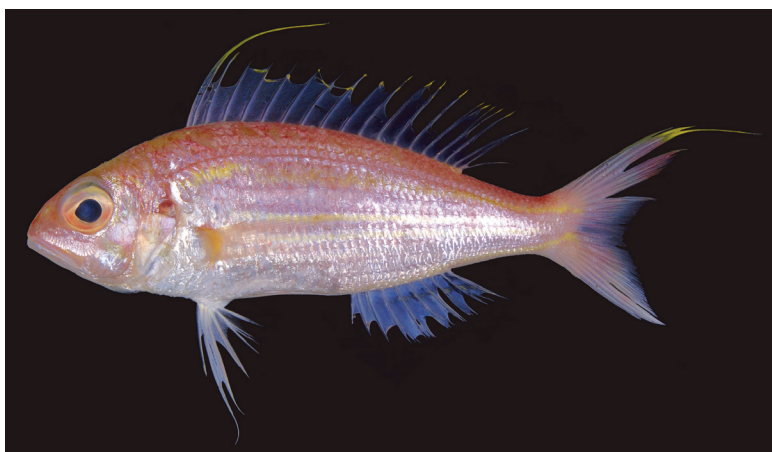
15 cm SL. **Distribution:** West Pacific. **Remarks:** found on sand or mud bottoms in depths of 12 to 70 m.

(M. Matsunuma)

***Nemipterus nematophorus***  
(Bleeker, 1854)

Doublewhip Threadfin Bream

D X, 9; A III, 7; P<sub>2</sub> I, 5; GR 12–15. Body elongate, compressed; body depth 2.9–3.5 in standard length. Posterior margin of suborbital and lower preopercular margin not serrated; suborbital spine absent. Suborbital depth 1.4–2.6 in eye diameter. Ventral margin of orbit reaching a horizontal line through snout tip and upper base of pectoral fin. First 2 dorsal-fin spine almost fused, not separated by a membrane; first spine prolonged; membranes between dorsal-fin spines not strongly incised. Upper lobe of caudal fin filamentous. Pectoral fin reaching a vertical through between anus and anal-fin origin. Three transverse scale rows on preopercle. **Color:** body pinkish dorsally, silvery ventrally, with yellow longitudinal stripes below lateral line and a distinct yellow blotch at anterior lateral line. Dorsal fin



*Nemipterus nematophorus*, KAUM-I. 23223, 10.9 cm SL  
Gulf of Thailand (SS), 9 Sept. 2009

translucent white, with yellow margin. Pelvic and anal fins white. Pectoral fin translucent white. Caudal fin pinkish white; tip of upper lobe yellow. **Size:** maximum standard length 20 cm. **Distribution:** Indo-Malay Artipelago,

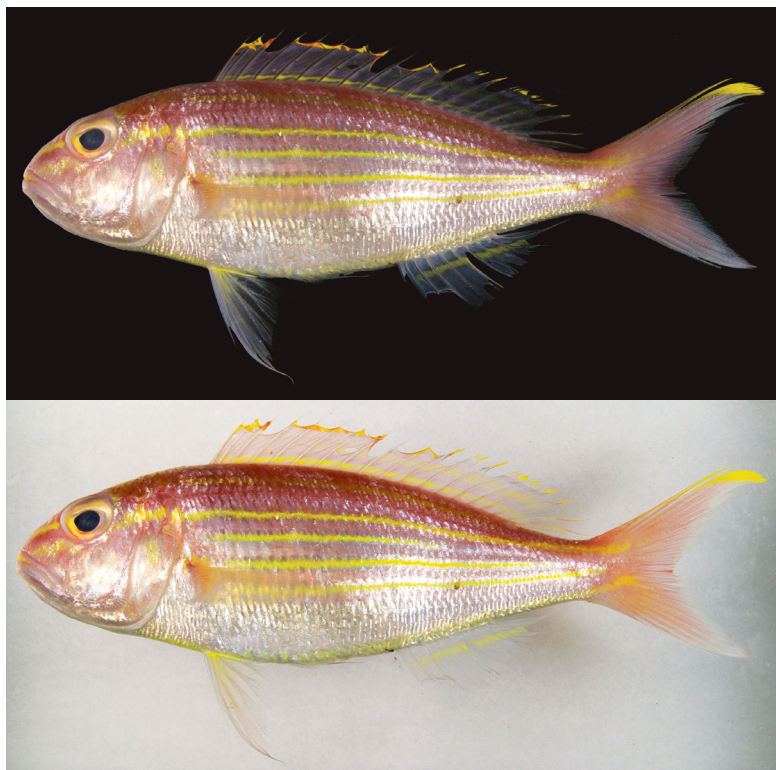
from Bay of Bengal to Indonesia, Philippines, and southern China. **Remarks:** usually occurs on sandy or muddy bottoms at depths of less than 50 m. Taken by bottom trawl and gill net. (H. Motomura)

*Nemipterus tambuloides*  
(Bleeker, 1853)

Fivelined Threadfin Bream

D X, 9; A III, 7; P<sub>1</sub> 16; P<sub>2</sub> I, 5; GR 6–8. Body moderately elongate, compressed; body depth 3.2 to 3.6 in SL. Posterior margin of suborbital and lower preopercular margin not serrated; suborbital spine absent. Ventral margin of orbit tangent to or just above a horizontal line through snout tip and upper base of pectoral fin. Pectoral and pelvic fins long; caudal fin deeply forked, tip of upper lobe pointed. Three transverse scale rows on preopercle. **Color:** body pinkish dorsally, silvery ventrally, 5 well-defined yellow stripes along body. Dorsal fin translucent pink, with yellow margin; a narrow yellow stripe just above base fin. Anal fin translucent bluish white with pale yellow stripe near base of fin. Caudal fin bright rosy, upper tip yellow. **Size:** maximum length 23 cm SL. **Distribution:** the Andaman Sea and West Central Pacific. **Remarks:** usually occurs on sand or mud bottoms in depths of 50 to 70 m.

(M. Matsunuma)



*Nemipterus tambuloides*, KAUM-I. 32968, 14.7 cm SL  
off Chantha Buri (SP), 1 Nov. 2010

*Pentapodus setosus*  
(Valenciennes, 1830)

Butterfly Whiptail

D X, 9; A III, 7; P<sub>1</sub> 15; P<sub>2</sub> I, 5; LL 46–48; GR 16–17. Body moderately elongate, fusiform; snout length greater than eye diameter. Scales on top of head reaching forward to or in front of middle of eyes; six transverse scale rows on preopercle; lower limb of preopercle naked. Pelvic fins short, not reaching level of anus; caudal fin forked, upper lobe produced into a very long trailing filament. **Color:** body whitish, pale brownish dorsally; a yellow stripe from behind eye, gradually arching on back and terminating in a black spot on upper caudal peduncle; a narrow blue line running through yellow stripe, this line convergent



*Pentapodus setosus*, KAUM-I. 23439, 16.4 cm SL  
Gulf of Thailand (SS), 24 Sept. 2009

with a blue line from origin of anal fin, both lines meeting at an acute angle behind black spot on caudal peduncle; 2 bluish stripes across snout, first from middle of eye to tip of snout, second from upper lip to lower margin of eye.

Dorsal fin pale blue, with yellow margin; caudal fin pinkish, filament pinkish brown. **Size:** maximum length 17.5 cm SL. **Distribution:** West Central Pacific. **Remarks:** found in off-shore waters. (M. Matsunuma)



***Scolopsis monogramma***  
(Cuvier, 1830)

Monogrammed Monocle Bream

D X, 9; A III, 7; P<sub>1</sub> 16–17; P<sub>2</sub> I, 5; LL 36–39. Body relatively deep, compressed; body depth 2.4–3.8 in SL. Suborbital margin with a large backwardly pointing spine; no antrorse spine just below eye; lower limb of preopercle scaled. Pelvic fin reaching to anus when depressed; caudal fin forked or lunate, upper lobe a little longer than lower lobe or produced into a short filament. **Color:** head and body grayish dorsally, silvery ventrally; dusky midlateral stripe on body; some sky blue streaks on head. **Size:** commonly 18 cm SL. **Distribution:** the Andaman Sea and West Pacific. **Remarks:** found in coastal waters with sandy or muddy bottom around coral reefs in depths to 50 m.

(K. Shibukawa)



*Scolopsis monogramma*, KAUM-I. 47684, 16.5 cm SL  
Gulf of Thailand (SS), 6 July 2012



*Scolopsis taenioptera*, KAUM-I. 32805, 21.3 cm SL  
Gulf of Thailand (SP), 25 Oct. 2010

***Scolopsis taenioptera***  
(Cuvier, 1830)

Lattice Monocle Bream

D X, 9; A III, 7; P<sub>1</sub> 17–18; P<sub>2</sub> I, 5; LL 45–48. Body relatively deep, compressed; body depth 2.7–3.1 in SL. Suborbital with a large backwardly pointing spine; no antrorse spine just below eye; external edge of maxilla smooth; lower limb of preopercular naked. Pelvic fin reaching to anus when depressed; caudal fin forked or lunate, upper lobe not produced into a filament. **Color:** head and body grayish dorsally, silvery ventrally; orange or red spot at upper part of pectoral fin base. **Size:** commonly 15 cm, maximum 20 cm SL. **Distribution:** the Andaman Sea and West Pacific. **Remarks:** found in offshore waters with sandy or muddy bottom in depths to 50 m.

(K. Shibukawa)



*Scolopsis vosmeri*, KAUM-I. 47683, 12.0 cm SL  
Gulf of Thailand (SS), 6 July 2012

***Scolopsis vosmeri***  
(Bloch, 1792)

Whitecheek Monocle Bream

D X, 8–9; A III, 7; P<sub>1</sub> 18–19; P<sub>2</sub> I, 5; LL 41–44; GR 11–12. Body deep, compressed; depth 2–2.6 in SL. Suborbital with a large backwardly-pointed spine; no antrorse spine just below eye; external edge of maxilla smooth. Pectoral fin short, not reaching to level of anus; pelvic fin reaching to or be-

yond anus when depressed; caudal fin forked. Scales on top of head extending forward to between level of snout and anterior nostril; lower limb of preopercle scaled. **Color:** head and body brownish, paler ventrally; distinct, broad white vertical bar on head. **Size:**

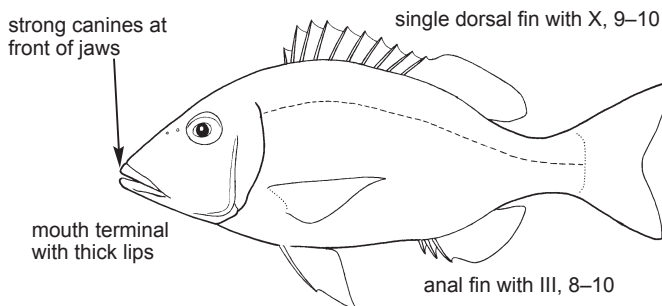
16 cm SL, commonly 15 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in offshore or coastal waters with sandy or muddy bottom around coral reefs. Caught by traps and trawls; marketed fresh.

(K. Shibukawa)

## LETHRINIDAE

### Emperors

Medium to large sized (up to 100 cm), oblong and compressed fishes. Body compressed, covered with ctenoid scales; lateral line continuous. Cheek scales absent in *Lethrinus*, whereas present in the other genera; mouth terminal with relatively thick lips; strong canines at front of jaws; either conical or molariform teeth on sides of jaws; no teeth on roof of mouth; branchiostegals 6. A single dorsal fin with X spines and 9–10 soft rays; anal fin with III spines and 8–10 soft rays; pectoral fin with 13–15 soft rays; pelvic fin below base of pectoral fin, with I spine and 5 soft rays; caudal fin emarginated or forked. Scales ctenoid, moderate in size. Vertebrae 24. **Color:** head and body silvery, gray, and light or reddish brown, frequently mottled, spotted or striped with dusky, blue, yellow or red. **Remarks:** commonly found in coastal waters around coral and rocky reefs, seagrass beds and mangroves. Carnivorous, feeds on various organisms, e.g., fishes, mollusks, crustaceans, polychaetes, and sea urchins. Esteemed as food fish, caught by handline, traps and trawls.



ted or striped with dusky, blue, yellow or red. **Remarks:** commonly found in coastal waters around coral and rocky reefs, seagrass beds and mangroves. Carnivorous, feeds on various organisms, e.g., fishes, mollusks, crustaceans, polychaetes, and sea urchins. Esteemed as food fish, caught by handline, traps and trawls.

**Similar families occurring in the area:** Haemulidae – chin with distinct pores; scales on cheek. Lutjanidae – teeth on roof of mouth; scales on cheek. Sparidae – usually more spines in dorsal fin; scales on cheek  
(H. Motomura & K. Shibukawa)

### *Gymnocranius elongatus*

Senta, 1973

#### Forktail Large-eye Bream

D X, 10; A III, 10; P<sub>1</sub> 14; P<sub>2</sub> I, 5; LLp 47–48. Body oblong, compressed; its depth 2.2–2.4 in SL. Outer surface of maxilla smooth. Ventral margin of orbit intersected by line from tip of snout to middle of caudal-fin fork. Sides of jaws with canines and villiform teeth. Cheek with 4–6 transverse scale rows; inner surface of pectoral fin axil not covered with scales. Caudal fin strongly forked, with pointed tips; median rays distinctly shorter than eye diameter. **Color:** body silvery, sometimes slightly brownish dorsally; about 8 transverse brown bars on sides; first bar through eye and across cheek. Fins mainly clear to yellow-orange; a narrow brown bar often across pectoral-fin base; caudal fin margins and tips often deep red. **Size:** maximum length about 35 cm. **Distribu-**



*Gymnocranius elongatus*, KAUM-I. 33217, 18.9 cm SL  
off Chanthaburi (SP), 30 Nov. 2010

**tion:** eastern Indian Ocean and western Pacific Ocean. **Remarks:** occurs in coastal and shelf waters at depths between about 50 and 100 m. Caught mostly with bottom trawls.

(M. Matsunuma)

***Gymnocranius griseus***  
(Temminck & Schlegel, 1843)

Gray Large-eye Bream

D X, 10; A III, 10; P<sub>1</sub> 14; P<sub>2</sub> I, 5; LLp 46–48. Body oblong, compressed; its depth comparatively deep, about 1.9–2.2 in SL. Outer surface of maxilla smooth. Ventral margin of orbit above horizontal line through snout tip and middle of caudal fin fork. Sides of jaws with canines and villiform teeth. Cheek with 4 transverse scale rows; inner surface of pectoral fin axil not covered with scales. Caudal fin moderately forked, with pointed tips; median rays slightly greater than eye diameter. **Color:** body silvery; frequently with a diffuse to vivid pattern of 5 to 8 narrow dark bars on side; first bar through eye and across cheek. Fins mainly clear to yellowish; a narrow brown bar often across pectoral-fin base. **Size:** maximum length about 35 cm. **Distribution:** distributed in the eastern Indian



*Gymnocranius griseus*, KAUM-I. 23440, 13.9 cm SL  
Gulf of Thailand (SS), 24 Sept. 2009

Ocean and the western Pacific from southern Japan to western Australia. **Remarks:** occurs in continental shelf and coastal inshore waters at depths between about 20 and 80 m. Caught mostly with bottom trawls. (H. Motomura)

***Lethrinus lentjan***  
(Lacepède, 1802)

Pink Ear Emperor

D X, 9; A III, 8; P<sub>1</sub> 13; P<sub>2</sub> I, 5; LLp 46–47. Body moderately deep; its depth 2.5–2.8 in SL. Dorsal profile of snout around straight. No scales on cheek; inner surface of pectoral-fin base scaled or naked; 6 longitudinal scale rows (including small scales beneath dorsal-fin base) between lateral line and base of middle dorsal-fin spine. **Color:** body grayish dorsally, silvery ventrally; whitish spot at center of each scale on body; posterior margin of opercle red; base of pectoral fin sometimes with red marking; caudal fin mottled. **Size:** 52 cm. **Distribution:** Indo-West Pacific **Remarks:** found in lagoons, coral reefs and seagrass beds; juveniles enter estuaries and mangrove swamps. Carnivorous, feeds on crustaceans, mollusks, polychaetes and fishes. Esteemed as food fish. (K. Shibukawa)



*Lethrinus lentjan*, KAUM-I. 23235, 17.6 cm SL  
Gulf of Thailand (SS), 9 Sept. 2009



## SPARIDAE

### Seabreams or Porgies

Medium to large sized (up to 100 cm) fishes, with body oblong, moderately deep and compressed. Head large, often with a steep upper profile; mouth subhorizontal and slightly protrusible, upper jaw never reaching a vertical line through middle of eye; hind tip of premaxilla overlapping maxilla; jaw teeth well developed, differentiated into either conical, or flattened, and often rounded; vomer and palatines toothless. Gill rakers variable, 7–20 on lower limb of first gill arch. Dorsal fin single, with X–XIII spines and 9–17 soft rays, the spiny and soft portions not separated by a notch; anal fin with III spines and 7–15 soft rays; pectoral fins usually long and pointed; pelvic fin with I spine and 5 soft rays, and an axillary scale at base; caudal fin moderately deeply emarginate or forked. Scales cycloid or weakly ctenoid.

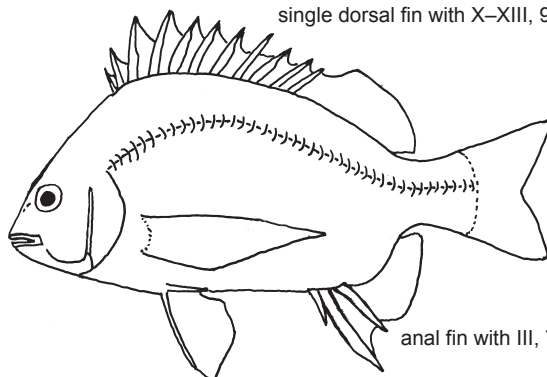
**Color:** overall color highly variable, from pinkish or reddish to yellowish or grayish, often with silvery

or golden reflections, often with dark or colored spots, stripes, or bars.

**Remarks:** inhabits tropical and temperate coastal waters; occasionally found in estuaries. Most seabreams are excellent food fish and are of notable commercial importance.

**Similar families occurring in the area:** Haemulidae – edge of preopercle serrate; suborbital space scaled; ; no molar teeth. Lutjanidae – edge of preopercle usually serrated, and of-

single dorsal fin with X–XIII, 9–17



ten excavated to accommodate a bony knob; no molar or incisor-like teeth. Lobotidae – edge of preopercle strongly toothed; no molar teeth; dorsal, anal and caudal fins rounded. Lethrinidae – posterior tip of maxilla overlapping premaxilla; 8–11 soft dorsal-fin rays (9–17 in Sparidae); incisor-like teeth never present.

(M. Matsunuma)

#### *Acanthopagrus pacificus* Iwatsuki, Kume & Yoshino, 2010

##### Pacific Seabream

D XI, 11; A III, 8; P<sub>1</sub> 15; LL<sub>p</sub> 42–46. Body deep and moderately compressed; mouth slightly oblique; lips thick; 6 canines anteriorly in upper jaw, 6 in lower jaw; ventral edge of anterior two infraorbitals straight in juveniles, but a moderately curved concavity in adults. Second anal-fin spine robust, clearly longer than 3rd; caudal fin slightly forked, with rounded lobes. Scale rows between 5th dorsal fin spine base and lateral line  $3\frac{1}{2}$ ; front edge of predorsal fin scaly area on head slightly convex, without small scales. **Color:** head and body silvery gray, whitish ventrally; pectoral fin hyaline or somewhat dusky dorsally; other fins dusky. **Size:** 45 cm SL. **Distribution:** West Central Pacific, from the Ryukyu Islands south to northern Australia. **Remarks:** found in shallow coastal waters; juvenile entering lower reaches of rivers. (M. Matsunuma)

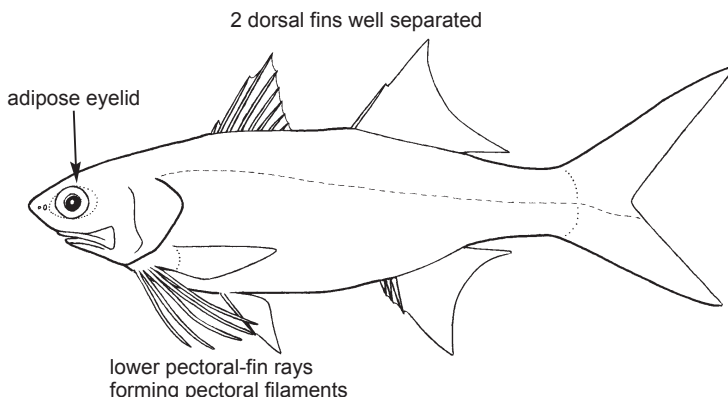


*Acanthopagrus pacificus*, KAUM-I. 32902, 18.0 cm SL  
Bang Pakong, 30 Oct. 2010

## POLYNEMIDAE

### Threadfins

Body elongate to moderately deep, compressed; size from about 10 to 200 cm. Snout obtusely conical, overhanging. Adipose eyelid covering eye. Mouth ventral, near-horizontal and large; lip on upper jaw absent or poorly-developed; maxilla extending beyond level of posterior margin of eye; supramaxilla absent. Teeth villiform in broad bands on jaws, vomer, palatines and ectopterygoids (vomerine teeth absent in some species); canine, molariform or incisoriform teeth absent. 7 branchiostegal rays, one ray present on epiphyal. Two well-separated dorsal fins; first dorsal fin with 7 or 8 spines; second dorsal fin with a spine and 11 to 18 soft rays. Anal fin with 2 or 3 spines and 10 to 18 soft rays. Pectoral fins divided into an upper part with 12 to 19 rays joined by membrane and a lower part with 3 to 16 separate soft rays (pectoral filaments). Pelvic fins with a spine and 5 soft rays. Caudal fin deeply forked. Scales weakly



ctenoid, extending onto head; scales covering most of dorsal, pectoral, anal and caudal fins; lateral line extending onto posterior margin of caudal fin; trisegmental pterygiophores absent. Vertebrae 10 precaudal and 14 or 15 caudal; supraneural bones 0 to 3. **Color:** silvery, golden or brown. A large black spot at anterior lateral line or several longitudinal dark stripes in some species.

**Remarks:** taken over sandy or muddy bottoms in tropical and subtropical coastal, brackish and freshwater. Feeds mainly on crustaceans and small fishes. Some species hermaphrodites.

**Similar families occurring in the area:** pectoral fin and filament characters (see above description) distinguish Polynemidae from all other families. (H. Motomura)

### *Eleutheronema tetradactylum* (Shaw, 1804)

#### Fourfinger Threadfin

D VIII + I, 13–15; A III, 14–16; P<sub>1</sub> 15–19 + 4 filaments; P<sub>2</sub> I, 5; LLp 71–80; GR 6–18. Body elongate, moderately compressed. Posterior margin of maxilla extending well beyond a vertical through posterior margin of adipose eyelid. Upper jaw length 5.9–7.1 in standard length. Anterior parts of lower jaw with small teeth extending onto lateral surface, adjacent portion of lip absent; tooth plate extension onto lateral surface of lower jaw 11.1–14.3 in standard length; vomer with deciduous tooth plates on both sides, except in juveniles. Longest pectoral filament not reaching origin of anal fin. Swimbladder absent. **Color:** upper sides of head and trunk with slight darkish silver tinge, becoming lighter on lower sides. Anterior margins of



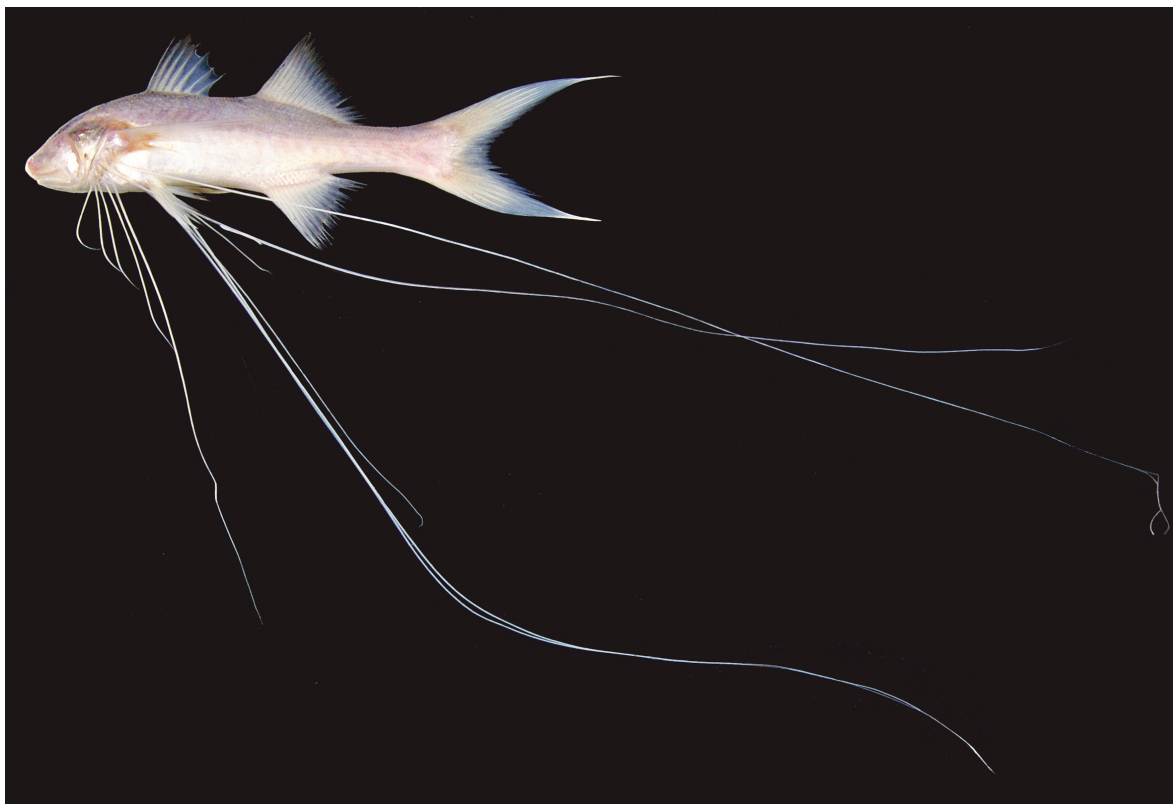
*Eleutheronema tetradactylum*, KAUM-I. 32955, 18.6 cm SL  
Rayong, 31 Oct. 2010

first and second dorsal fins blackish, remaining parts translucent and slightly blackish, respectively; pectoral fin vivid yellow (dusky yellow in large specimens over ca. 350 mm standard length). **Size:** maximum total length about 200 cm. **Distribution:** distributed in the Indo-West Pacific, from the

Persian Gulf east to Papua New Guinea and northern Australia. **Remarks:** generally occurs on continental shelves on muddy and sandy substrata, and frequently enters brackish waters, especially as juveniles. Sex changing male to female with growth.

(H. Motomura)





***Polynemus aquilonaris***  
**Motomura, 2003**

Northern Paradise Fish

D VIII + I, 15–19; A III, 11–13; P<sub>1</sub> 15–17; P<sub>1</sub> filaments 7; P<sub>2</sub> I, 5; LLP 80–86; GR 25–29. Body elongate, compressed. Snout pointed; occipital profile nearly straight. Posterior margin of maxilla extending well beyond level of posterior margin of adipose eyelid. Depth of posterior margin of maxilla slightly less than eye diameter; lip on lower jaw well developed, dentary teeth restricted to dorsal surface; teeth villiform in broad bands on vomer, palatines and ectopterygoids.

Posterior margin of preopercle serrated. First pectoral filament shortest, not reaching to level of posterior tip of pelvic fin; sixth pectoral filament, usually longest, its length 260 to 371% of standard length, extending well beyond posterior tips of caudal-fin lobes. Caudal fin deeply forked, upper and lower caudal-fin lobes not filamentous. **Color:** body greyish silver dorsally, silver ventrally. Pectoral fin translucent; base of pectoral filaments white, becoming blackish on posterior

tips. Base and posterior margin of pelvic fin white, remaining parts translucent. **Size:** maximum standard length at least 16 cm. **Distribution:** the Chao Phraya River system (Thailand), Mekong River system below the Khone waterfalls of Laos (Cambodia, southernmost of Laos and southern Viet Nam). **Remarks:** occurs on sandy or muddy bottoms in freshwater rivers and estuaries. Feeds on crustaceans, small fishes, and benthic organisms.

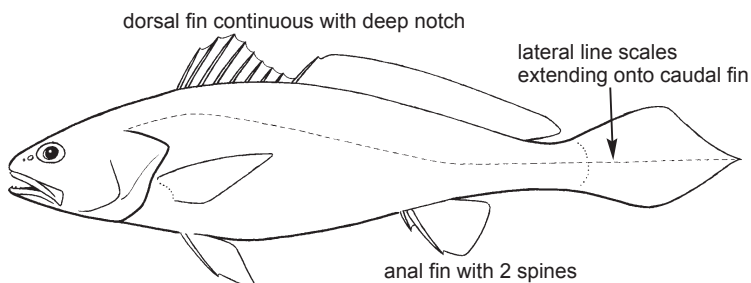
(H. Motomura)

*Polynemus aquilonaris*, KAUM–I. 23381, 9.7 cm SL  
 Bang Pakong, 22 Sept. 2009

## SCIAENIDAE

### Croakers

Small to large fishes, reaching 200 cm standard length. Body moderately elongate, compressed. Body, except snout tip, completely covered with scales. Enlarged teeth always form outer series in upper jaw, inner series in lower jaw; vomer and palatines without teeth. Dorsal fin continuous, with deep notch between anterior and posterior portions; with VIII to X spines anteriorly and I spines and 21 to 44 soft rays posteriorly; base of posterior portion much longer than anal fin base. Anal fin with II spines and 6 to 12 soft rays. Caudal fin emarginate to pointed, never deeply forked. Pelvic fins with I spine and 5 soft rays. Lateral line scales extending to posterior margin of caudal fin. Swimbladder well developed with thick wall, with horn-



like, tube-like, or arborescent appendages. **Color:** variable from silvery to black; with spots and dark bands in some species.

**Remarks:** occurs in coastal waters, estuaries and rivers. No records from oceanic island groups distant from a continental shelf. Usually found over muddy or sandy

bottoms.

**Similar families occurring in the area:** the following combination of characters distinguish Sciaenidae from all other families: anal fin with II spines and lateral line scales extending to posterior margin of caudal fin.

(H. Motomura)

#### *Aspericorvina jubata* (Bleeker, 1855)

##### Prickly Croaker

D XI, 22–25; A II, 7–9; P<sub>2</sub> I, 5; LGR 6–9. Body moderately deep. No barbel on chin. Snout profile rounded. Larger teeth in outer row and smaller teeth in inner row on upper jaw; villiform teeth on lower jaw. Ctenoid scales, with 5–6 strong spines posteriorly on each scale, covering on head, anterodorsal portion of body, throat, and abdomen; cycloid scales on remaining parts of body. Swimbladder carrot-shaped, with about 16 pairs of appendages. **Color:** body light gray dorsally, silver ventrally. Opercle with large dark blotch. Dorsal fin translucent white, with dark yellow margin. Pectoral fin translucent yellow with scattered melanophores. Pelvic and anal fins whitish. Caudal fin yellowish white. **Size:** maximum standard length 16 cm. **Distribution:** distributed in the Gulf of Thailand, Sumatra, and Borneo. **Remarks:** occurs in shallow coastal waters, estuaries, and rivers.

(H. Motomura)



*Aspericorvina jubata*, KAUM–I. 22948, 9.9 cm SL  
Bang Pakong, 31 Aug. 2009

***Bahaba polykladiskos***  
(Bleeker, 1852)

Spine Bahaba

D XI, 27–30; A II, 7; P<sub>2</sub> I, 5; LGR 7–8. Body relatively elongate, with slender caudal peduncle. No barbel on chin. Snout profile somewhat pointed. Posterior margin of maxilla extending beyond vertical through middle of eye; larger teeth in outer row and smaller teeth in inner row on upper jaw. Cycloid scales covering on snout and cheek; ctenoid scales on remaining parts of body; caudal fin thickly covered with small scales. Swimbladder carrot-shaped, with one pair of extremely long and simple appendages at anterior end of swimbladder. **Color:** body gray dorsally, silver ventrally. Dorsal, pectoral, pelvic, and anal fins translucent white. Caudal fin yellowish white. **Size:** maximum standard length 40 cm. **Distribution:** distributed in Thailand, Cambodia, Vietnam, and Borneo. **Remarks:** occurs in shallow coastal waters and estuaries.

(H. Motomura)



*Bahaba polykladiskos*, KAUM-I. 23358, 7.9 cm SL  
Bang Pakong, 22 Sept. 2009



*Boesemania microlepis*, KAUM-I. 32752, 10.6 cm SL  
Bang Pakong, 23 Oct. 2010

***Boesemania microlepis***  
(Bleeker, 1858)

Boeseman Croaker

D X–XI, 27–34; A II, 7; P<sub>2</sub> I, 5; LGR 7–12. Body moderately deep, with slender caudal peduncle. No barbel on chin. Larger teeth in outer row and smaller teeth in inner row on upper jaw; larger teeth in inner row on lower jaw. Second anal-fin spine strong and long, its length nearly half of head length. Cycloid scales covering on snout and cheek; ctenoid scales on remaining parts of body. Caudal fin pointed, thickly covered with small scales. Swimbladder carrot-shaped, with pair of anteriorly directed appendages and 5–6 pairs of posteriorly directed appendages. **Color:** body brown dorsally, yellowish silver ventrally. Pectoral fin translucent yellow, with scattered melanophores; other fins yellowish white. **Size:** maximum standard length about 100 cm. **Distribution:** distributed in Vietnam, Laos, Cambodia, Thailand, Malaysia, and Indonesia (Sumatra). **Remarks:** occurs in estuaries and rivers.

(H. Motomura)



*Dendrophysa russelli*, KAUM-I. 32692, 8.4 cm SL  
Gulf of Thailand (SS), 22 Oct. 2010

***Dendrophysa russelli***  
(Cuvier, 1829)

Goatee Croaker

D XI, 25–28; A II, 7; P<sub>2</sub> I, 5; LGR 8–10. Body relatively deep. Mouth inferior; posterior margin of maxilla not extending beyond a vertical through posterior margin of orbit. A pointed barbel on chin. Swimbladder carrot-shaped, with about 14–17 pairs of fan-like appendages along its sides; first pair entering head beyond transverse septum. **Color:** body gray dorsally, white ventrally. A dark brown broad

band on nape. Opercle with a deep blue blotch. Spinous portion of dorsal fin faintly edged with black. **Size:** maximum standard length 25 cm. **Distribution:** distributed in the eastern Indian Ocean and the western central Pacific Ocean, from the Bay of Bengal east to southern China, the Philippines and eastern Indonesia. **Remarks:** occurs in coastal waters and estuaries.

(H. Motomura)



***Johnius amblycephalus***  
(Bleeker, 1855)

Bearded Croaker

D XI, 23–26; A II, 7; P<sub>2</sub> I, 5; LGR 6–9. Body moderately elongate. A stiff, blunt barbel on chin. Teeth differentiated into large and small in upper jaw, villiform teeth only in lower jaw. Second to fifth dorsal fin spines prolonged. Scales on head and body cycloid; small scales covering soft-rayed portions of dorsal and anal fins. Swimbladder hammer-shaped, with 14 or 15 pairs of arborescent appendages along its sides, first pair entering head beyond transverse septum and sending a palmate branch to the front of pectoral arch. **Color:** body black or dark brown dorsally, whitish or cream yellow ventrally; prolonged spinous portion of dorsal fin black distally. **Size:** maximum standard length about 25



*Johnius amblycephalus*, KAUM-I. 23187, 13.7 cm SL  
Gulf of Thailand (SS), 8 Sept. 2009

cm. **Distribution:** Indo-West Pacific, from Pakistan east to southern China and northeastern Australia. **Remarks:** occurs in shallow coastal waters and estuaries. (H. Motomura)

***Johnius carouna***  
(Cuvier, 1830)

Caroun Croaker

D XI, 26–30; A II, 7; P<sub>2</sub> I, 5; LGR 10–12. Body moderately deep. No barbel on chin. Snout profile rounded. Larger teeth in outer row and smaller teeth in inner row on upper jaw; villiform teeth on lower jaw. Cycloid scales covering on snout, cheek, and throat; ctenoid scales on remaining parts of body; small scales covering soft-rayed portions of dorsal and anal fins. Swimbladder hammer-shaped, with 14 or 15 pairs of arborescent appendages. **Color:** body light gray dorsally, silver ventrally. Opercle yellowish. Upper pectoral fin yellowish with scattered melanophores; lower fin translucent white. Anterior pelvic fin pale yellow, remaining part whitish. Lower margins of anal and caudal fins yellowish; remaining parts whitish. **Size:** maximum standard length about 25 cm. **Distribution:** distributed in the Indo-West Pacific, from India east to Borneo and southern China. **Remarks:** occurs in shallow coastal waters and estuaries. (H. Motomura)



*Johnius carouna*, KAUM-I. 22946, 8.2 cm SL  
Bang Pakong, 31 Aug. 2009

*Johnius heterolepis*

Bleeker, 1873

Largescale Croaker

D XI–XII, 25–28; A II, 7; P<sub>2</sub> I, 5; LGR 9–11. Body moderately deep. No barbel on chin. Snout profile pointed. Larger teeth in outer row and smaller teeth in inner row on upper jaw; villiform teeth on lower jaw. Scales on flank larger than pored lateral-line scales; cycloid scales covering on snout, cheek, and anterior half of opercle; ctenoid scales on remaining parts of body; small scales covering soft-rayed portions of dorsal and anal fins. Swimbladder hammer-shaped, with 14 pairs of arborescent appendages. **Color:** body grayish to yellowish gray dorsally, yellowish silver ventrally. Opercle blackish. Pectoral and caudal



*Johnius heterolepis*, KAUM–I. 32691, 12.3 cm SL  
Gulf of Thailand (SS), 22 Oct. 2010

fins yellowish. Anterior portions of pelvic and anal fins yellowish, remaining parts whitish. **Size:** maximum standard length about 15 cm. **Distribution:** previously known only from Malaysia and Indonesia; the pho-

tographed specimen may represent the first record of the species from northern Gulf of Thailand. **Remarks:** occurs in shallow coastal waters.

(H. Motomura)

*Otolithes ruber*

(Bloch &amp; Schneider, 1801)

Tigertooth Croaker

D X–XI, 26–30; A II, 7; P<sub>2</sub> I, 5; LGR 8–11. Body slender, cylindrical. Snout not swollen or projecting, its dorsal profile rising evenly to dorsal fin origin. Posterior margin of maxilla reaching a vertical through posterior margin of orbit. No barbels on chin. Teeth differentiated into large and small in both jaws, with 1 or 2 pairs of strong canines at front of one or both jaws. Scales cycloid, but a few ctenoid on lower part of caudal peduncle. Swimbladder carrot-shaped with 32–36 pairs of fan-like appendages along sides, each appendage lodged beside bladder and none widely lapping dorsal surface of bladder wall, first pair not entering head. **Color:** body brownish dorsally, silvery with a golden sheen on middle and ventrally, often with oblique dark streaks dorsally. Pectoral, pelvic, and anal fins reddish or light brown. **Size:** maximum standard length 70 cm. **Distribution:** widely distributed in the Indo-West Pacific, from South Africa east to southern China and northeastern Australia. **Remarks:** occurs in shallow coastal waters to depths of 40 m. Feeds mainly on prawns and fishes. (H. Motomura)



*Otolithes ruber*, KAUM–I. 32687, 14.8 cm SL  
Gulf of Thailand (SS), 22 Oct. 2010



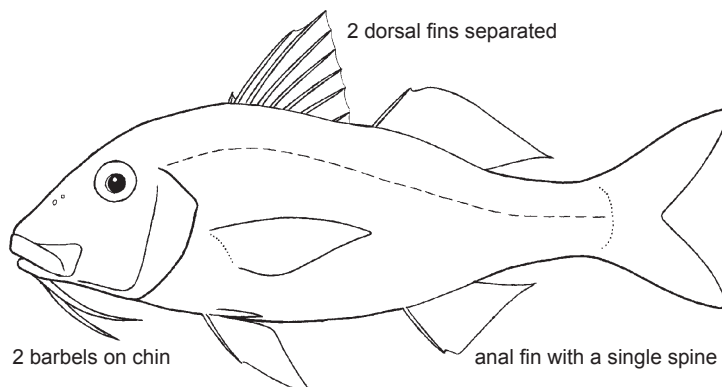
*Otolithes ruber*, KAUM–I. 23113, 7.5 cm SL  
Gulf of Thailand (SS), 6 Sept. 2009

## MULLIDAE

### Goatfishes

Body symmetrical, moderately elongate and compressed with eyes on opposite sides of head (size to 50 cm). Head moderately depressed. Mouth small and protractile with inferior lower jaw; a pair of barbels on chin; the cleft slightly oblique; small conical teeth in jaws, either in villiform bands or in 1 or 2 rows. Scales finely ctenoid and body completely scaly. Two well-separated dorsal fins, the first with VII–VIII slender spines (first spine often very small); the second fin with 9 soft rays (first unbranched); anal fin with 1 spine and 6–7 soft rays; caudal fin deeply forked; pectoral fins with 13–18 soft rays; pelvic fins with 1 spine and 5 soft rays; pectoral fins usually short with 13 to 18 rays; caudal fin deeply forked with 13 branched rays. Lateral line complete, following the contour of back, with 27–38 pored scales. Gill membrane with 3–4 branchiostegals, pseudobranchiae present, a single flat spine posteriorly on opercular margin of preopercular smooth.

**Color:** ground color often whit-



ish to light red; most species with distinctive black, brown, red, or yellow markings; median fins often with stripes or oblique bands.

**Remarks:** inhabit shallow seas, on open sand or mud bottoms. Carnivorous, feeding on a wide variety of small animals, especially crustaceans and worms. The barbels, with chemosensory receptors, are actively moved over or into the sediment to find food organisms.

**Similar families occurring in the**

**area:** Polymixiidae – the only other family with a pair of long barbels on chin; the species occur in deep water, about 200–400 m. Distinguished from Mullidae by the following combination of characters: a single, unnotched dorsal fin with IV–VI spines; anal fin with III–IV spines; barbels inserted well behind tip of lower jaw.

(S. Tafzilmeriam S. A. K.)

### *Parupeneus heptacanthus* (Lacepède, 1802)

#### Cinnabar Goatfish

D VIII + 9; A I, 6; P<sub>1</sub> 15–17; P<sub>2</sub> I, 5; LLp 27–28; GR 6–7 + 20–23. Body moderately elongate, its depth 3–3.55 times in standard length. Chin with 2 moderately long slender barbels, reaching beyond rear edge of preopercle. Anterodorsal profile of head convex. Posterior end of maxilla evenly convex. Mouth small with a single row of stout conical teeth on jaws, teeth large; teeth absent on vomer and palatines. Opercle with a small flat spine. Scales ctenoid. First dorsal fin with groove at the base, 1st spine very small. Caudal fin forked. **Color:** body brownish yellow to light red dorsally, silvery white ventrally; a small reddish brown spot beneath the lateral line under the rear of the first dorsal fin; dorsal fin with 2–3 black or dark orange



*Parupeneus heptacanthus*, KAUM-I. 33221, 17.2 cm SL off Chanthaburi (SP), 30 Nov. 2010

stripes; anal, pelvic and pectoral fins pale yellow; caudal fin with dark-orange cross stripes. **Size:** maximum total length about 37 cm, commonly to 25 cm. **Distribution:** Indo-Pacific. **Re-**

**marks:** occurs singly or in small groups, over muddy, sandy, rubble, or seagrass bottoms of lagoon and seaward reefs, usually below 15 m.

(S. Tafzilmeriam)



***Upeneus sulphureus***  
**Cuvier, 1829**

Sulphur Goatfish

D VIII + 9; A I, 7–8; P<sub>1</sub> 14–17; LL 33–36; GR 8–9 + 19–21. Body moderately elongate. Chin with 2 short barbels, 1.4–1.9 in head length. Lachrymal region lacking preorbital scales. Both jaws, vomer and palatines with teeth. Second dorsal and anal fins with scaled area basally. **Color:** body silvery greenish or pink dorsally, shading to silver on side and ventrally, with 2 narrow, brassy yellow stripes on side of body; 1st dorsal fin broadly tipped with black; caudal fin lacking dark cross bands. **Size:** reaching to ca. 20 cm. **Distribution:** Indo-West Pacific, including east coast of Africa, Indo-Malayan region, Japan, Australia and Fiji. **Remarks:** generally found on mud substrata at depths of 20–60 m.

(H. Imamura)



*Upeneus sulphureus*, KAUM-I. 33094, 12.2 cm SL  
Prachuap Khiri Khan, 13 Nov. 2010

***Upeneus sundaicus***  
**(Bleeker, 1855)**

Ochreband Goatfish

D VIII + I, 9; A I, 6; P<sub>1</sub> 14; P<sub>2</sub> I, 5; LLp 31–32; GR 4–6 + 19–22. Body moderately elongate and slender, its depth 3.55 to 4 times in standard length. Interorbital flat. Chin with 2 barbels which usually reach or extend slightly posterior to rear margin of preopercle. Opercle with small and weak spines. Mouth small, viliform teeth in a narrow band in jaws, on palatines and in 2 small patches on vomer. Scales large, ctenoid. Spinous of rays first dorsal fin acute, higher than second dorsal fin, 1st spine minute, the 2nd longest and strongest. Caudal fin forked. **Color:** body light reddish-brown dorsally, silvery white ventrally. One yellow stripe on body from eye to caudal peduncle. Dorsal fin with pale orange stripes; no bars on



*Upeneus sundaicus*, KAUM-I. 32900, 10.2 cm SL  
Ang Sila, 30 Oct. 2010

caudal-fin lobe, caudal fin brownish-yellow with dusky lower lobe; pectoral fins pale yellow; pelvic and anal fins yellowish; barbels yellow; peritoneum pale. **Size:** commonly to 13 cm.

**Distribution:** South China Sea, Indian Ocean and northwestern Australia. **Remarks:** found in mud or salty sand substrata at depth of 3–20 m.

(S. Tafzilmeriam)

*Upeneus tragula*  
Richardson, 1846

Freckled Goatfish

D VIII + 9; A I, 7; P<sub>1</sub> 13–14; P<sub>2</sub> I, 5; LLp 28–30; GR 5–7 + 15–18. Body elongate, its depth 3.9–4.25 times in standard length. Chin with 2 slender barbels, usually not reaching rear margin of preopercle. Mouth small with villiform teeth in a narrow band in jaws, on palatines, and in 2 small patches on vomer. Opercle with small and weak spines. Scales large, ctenoid; present on side of snout. Spinous rays of first dorsal fin acute, higher than second dorsal fin, 1st spine minute, the 2nd longest and strongest. Pelvic fins equal to pectoral fins. Caudal fin forked. **Color:** highly variable in colour, from red, to irregular dots and blotches on body; 3 dark blotches on first dorsal and 2 dark blotches on second dorsal; a dark reddish brown to blackish stripe from snout through behind eye to base of caudal fin; head and body above stripe brownish to greenish gray, flecked with small dark reddish brown or blackish spots; dorsal, pelvic, anal and both caudal-fin lobes with brown blackish stripes sep-



*Upeneus tragula*, KAUM-I. 33049, 11.0 cm SL  
Prachuap Khiri Khan, 9 Nov. 2010

arated by narrow white stripes; barbels usually yellow; peritoneum whitish. **Size:** maximum total length about 33 cm, commonly to 25 cm. **Distribution:** Indo-West Pacific. **Remarks:** found over sand and mud bottoms

near coral reefs, to a depth of 40 m; also common in estuaries. Generally solitary, but forms small to moderately large aggregations at all sizes.

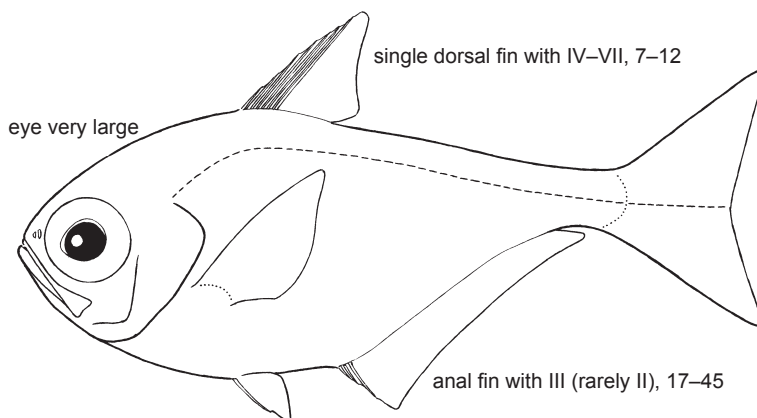
(S. Tafzilmeriam)

## PEMPHERIDAE

### Sweepers

Small to moderate sized (to 30 cm) marine fishes. Body compress, very deep (*Pempheris*) or slender (*Parapriacanthus*). Eye very large. Snout short. Maxilla broad, reaching to below pupil. Teeth small, in band in jaws, on palatine, and in V-shaped patch on vomer. Gill rakers long, usually 25–31. Dorsal fin single, with IV–VII graduated spines and 7–12 soft rays. Anal fin with III (rarely II) spines and 17–45 soft rays. Pelvic fin with I spine and 5 soft rays. Lateral line scales usually 40–82. Scales vary from ctenoid and adherent to cycloid and deciduous. **Color:** variable (e.g., silvery, pinkish, yellowish and brownish).

**Remarks:** usually seen by day in aggregations in caves or beneath



ledges, dispersing at night to feed independently on zooplankton.

**Similar family occurring in the**

**area:** Berycidae – pelvic fin with 7–13 soft rays. (H. Imamura)

#### *Pempheris ovalensis* Cuvier, 1831

##### Copper Sweeper

D VI, 9–10 (usually 9); A III, 36–45; P<sub>1</sub> 16–18 (usually 17); LL 54–79; GR 7–10 + 19–26. Body very deep at origin of dorsal fin, strongly tapering to narrow caudal peduncle; body depth about 1.9–2.4 in standard length; pre-pelvic area narrow and keeled. Base of anal fin very long; caudal fin slightly forked. Body covered by ctenoid scales except for chest with cycloid; 5–6 scale rows between lateral line and dorsal fin base. **Color:** body bronze, darker dorsally; dorsal fin with a dark leading edge that expands distally to produce dark tips on the first 2 or 3 soft rays; base and axil of pectoral fin dark to black. **Size:** maximum length 18 cm. **Distribution:** eastern Indian Ocean and western Pacific, from northern Australia to the Philippines, east to Micronesia. **Remarks:** found in coastal rocky reefs.

(M. Matsunuma)



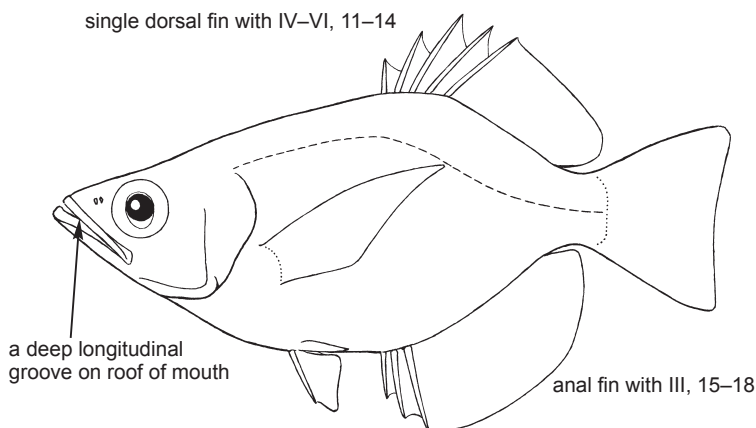
*Pempheris ovalensis*, KAUM-I. 47444, 10.7 cm SL  
Gulf of Thailand (SS), 20 June 2012



## TOXOTIDAE

### Archerfishes

Small to medium sized fishes (to about 50 cm). Body oval or rhomboidal-shaped and moderately compressed. Eye large, diameter nearly equal to snout length. Mouth moderately large, protractile, with lower jaw protruding; angle of jaw oblique, maxilla slender, scaly and without a supplemental bone. Fine villiform teeth on jaws, vomer, and palatines; a deep longitudinal groove on roof of mouth, which is converted to a tube when tongue is pressed against it. First gill arch with 2–8 gill rakers on lower limb. Dorsal fin single with IV–VI spines and 11–14 soft rays; anal fin with III spines and 15–18 soft rays; pelvic fins with I spine and 5 soft rays; pectoral fins with 11–15 rays; caudal fin truncate to slightly emarginate. Scales moderate to relatively large and ctenoid, covered head and median fins. **Color:** most species silvery white with a pattern



of dark bars, large spots, or irregular stripes on sides. **Remarks:** inhabit mangrove shores, estuaries, and fresh waters, always in shallow depths. Exhibit impressive hunting techniques in which they use jets of water to knock aerial insects into the water where they can be eaten.

**Similar families occurring in the area:** Pempheridae – snout blunt, dorsal-fin base short, positioned above pectoral fins; anal fin long, usually with more than 30 soft rays; occur in marine rather than estuarine and fresh-water habitats.

(U. Satapoomin)

#### *Toxotes chatareus* (Hamilton, 1822)

##### Spotted Archerfish

D IV–VI, 12–14; A III, 15–17; P<sub>1</sub> 11–14; LLp 29–37; LGR 5–7. Body shape rhomboid, moderately compressed. Eye large. Mouth moderately large, protractile, with lower jaw protruding; longitudinal axis from tip of snout to caudal fin passing through center of eye. Dorsal fin spines usually V, fourth spine usually the longest. Scales in lateral line usually 29–32; horizontal scale rows above lateral line 3–5, below lateral line 9–11. **Color:** silvery white with 6 or 7 variably-shaped blotched along the sides of body; caudal fin pale yellowish; anal fin pale basally, outer half of the fin blackish. **Size:** maximum length about 50 cm, rarely exceeding 35 cm. **Distribution:** Eastern Indian Ocean and western Pacific, from Sri Lanka and India to New Guinea and northern Australia. **Remarks:** inhabits mangrove shores, estuaries, and fresh waters. Feeds on terrestrial insects. (U. Satapoomin)

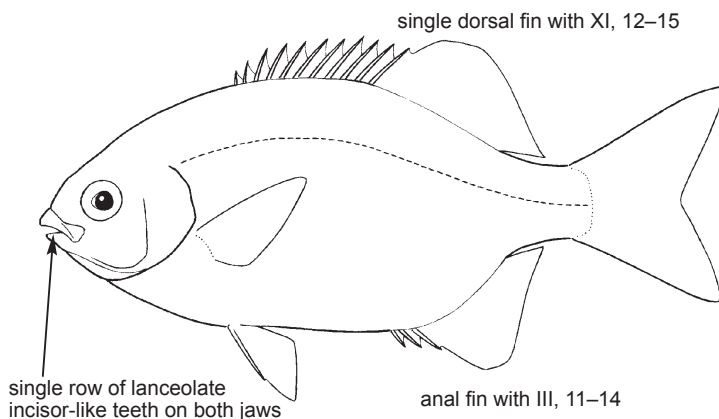


*Toxotes chatareus*, KAUM–I. 33199, 8.5 cm SL  
Bang Pakong, 26 Nov. 2010

## KYPHOSIDAE

### Sea Chubs (Rudder Fishes)

Medium-sized fishes (to 75 cm); body oblong or elliptical, moderately compressed. Head small. Snout short. Posteroventral corner of preopercle serrate. Opercle with 2 small, weak retrorse spines. Eye moderately small, its diameter shorter than snout length. Mouth small and terminal, single row of lanceolate incisor-like teeth on both jaws; minute canine-like teeth in 2 or 3 rows medial to incisor-like teeth; palatines, vomer, and tongue with a band of villiform teeth. Preorbital narrow, covering little of maxilla; maxilla barely reaching eye. Dorsal fin continuous, beginning above origin of pelvic fins, with XI spines and 12 to 15 soft rays; anal fin beginning slightly behind middle of body, with III spines and 11 to 14 soft rays; pectoral fins bluntly pointed posteriorly, with 16 to 20 rays, slightly longer than pelvic fins; pelvic fins beginning a little behind pectoral-fin base; caudal fin more or less forked, with pointed



lobes. Scales ctenoid and not deciduous, extending onto most of soft portions of dorsal and anal fins and proximal part of caudal fin. **Color:** dull olive or silvery black, lighter below; distinct longitudinal lines on sides.

**Remarks:** occurs on rocky and coral reefs in tropical and temperate waters. Herbivorous, feeding pri-

marily on benthic algae. Schooling, sometimes in a group of mixed species of other kypnosids.

**Similar families occurring in the area:** Sparidae – molar teeth often present; pectoral fins long. Lethriniidae – head much larger; lateral teeth conical or molar-like; pectoral fins long. (U. Satapoomin)

### *Kyphosus cinerascens* (Forsskal, 1775)

#### Blue Sea Chub

D XI, 11–13 (usually 12); A III, 10–12 (usually 11); P<sub>1</sub> 18; LLp 49–52; GR 7–9 + 19–22 = 26–31. Body ovate, compressed. Snout short, subequal to or shorter than eye diameter; dorsal contour of snout slightly steep. Mouth terminal; teeth incisor-like. Base of spinous portion of dorsal fin longer than base of soft rayed portion; soft rayed portion of fin well elevated, anterior soft rays clearly longer than longest dorsal fin spine; anterior soft rayed portion of anal fin well elevated, similar to soft rayed portion of dorsal fin; caudal fin slightly forked with pointed lobes. Nine to twelve (usually 10 or 11) scales between lateral line and dorsal fin origin; 17–21 (usually 18–20) scales between lateral line to anal fin origin. **Color:** body bluish dorsally, dusky grayish ventrally, with several bluish brown longitudinal lines on flank, large specimens (about



*Kyphosus cinerascens*, KAUM-I. 23875, 13.9 cm SL  
Gulf of Thailand (SS), 26 Sept. 2009

40 cm SL) uniformly dusky or dark blue dorsally; head with 2 oblique brown or bluish brown bands; one through eye, the other one below eye; dorsal and anal fins dark blue, margin of soft portion with darker band; pectoral fins silver blue near base, distal half slightly darker. **Size:** commonly

40 cm; maximum 50 cm TL. **Distribution:** widespread in the Indo-West Pacific, including the Red Sea, from South Africa east to Australia; north to southern Japan. **Remarks:** inhabits coastal areas, primarily coral and rocky reefs, often occurring on inner reefs. Herbivorous. (M. Matsunuma)



*Kyphosus vaigiensis*, KAUM-I. 23873, 15.9 cm SL  
Gulf of Thailand (SS), 26 Sept. 2009

***Kyphosus vaigiensis***  
**(Quoy and Gaimard, 1825)**

Brassy Chub

D X–XI, 13–15; A III, 12–13; P<sub>1</sub> 18–20; LLp 51–55; GR 8–10 + 21–24. Body ovate, compressed. Snout short; dorsal contour of snout steep. Mouth terminal; maxilla barely reaching to eye level; teeth incisor-like, fixed, in a single row on both jaws. Gill rakers on first gill arch usually 9 on upper limb, usually 22 or 23 on lower limb. Dorsal fin usually with XI spines, the sixth or seventh spines longest, and usually with 14 soft rays; anterior soft-rayed portion not elevated, a little shorter or

as long as longest dorsal-fin spine; anal fin usually with 13 soft rays, anterior portion not elevated; pectoral fins usually with 19 soft rays; caudal fin shallowly forked with pointed lobes. Pored scales in lateral line usually 52 or 53; scales above lateral line 11–14 (usually 12 or 13); scales below lateral line 18–21 (usually 18 or 19). **Color:** body bluish brown dorsally, silver ventrally, with several olive brown or yellow longitudinal lines on flank; head with 2 oblique olive brown

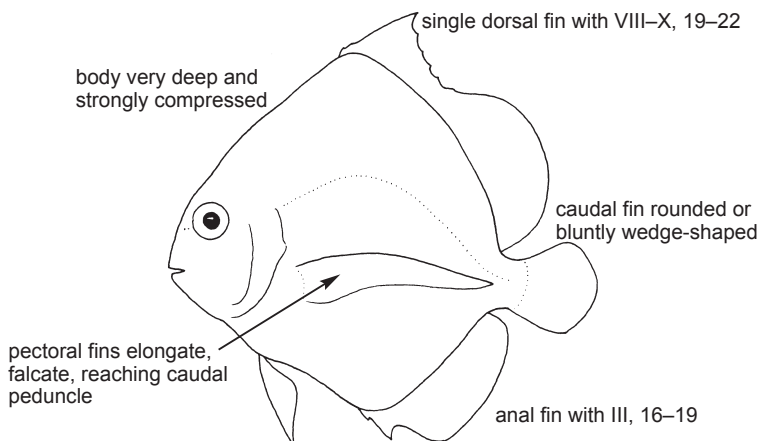
bands; dorsal and anal fins dark blue, margin of soft portion with darker band. **Size:** maximum length about 60 cm, commonly to 40 cm. **Distribution:** Indo-West Pacific, from South Africa and Red Sea to Easter Islands. **Remarks:** inhabits coastal areas, primarily in coral and rocky reefs, occasionally forming schools with other kyphosid fishes. Mainly herbivorous, feeding chiefly on seaweeds and associated invertebrates. (U. Satapoomin)



## DREPANIDAE

### Sicklefishes

Body oval and strongly compressed (up to 50 cm). Interorbital, preorbital, and broad preopercular flange naked; opercle scaly dorsally; ventral edge of preopercle serrate in juveniles. Mouth highly protrusible, forming a downward-pointing tube when protruded; jaws with bands of setiform teeth; no teeth on roof of mouth; maxilla exposed posteriorly, no supramaxilla. Branchiostegal membranes joined to isthmus; branchiostegal rays 6. A single dorsal fin, with VIII–X spines and 19–22 soft rays; anal fin with III spines and 16–19 soft rays; caudal fin rounded or bluntly wedge-shaped (almost truncate in large adults); pectoral fins elongate, falciform, reaching caudal peduncle, with 16–18 rays; pelvic fins with I spine, 5 soft rays, and a fleshy axillary process. Scales small, finely ctenoid, extending onto top of head and base of median fins; lateral line complete, strongly curved over pectoral fin; lateral-line scales 48–55. Vertebrae  $10 + 14 = 24$ . **Color:**



silvery gray above, silverywhite below, with dusky spots or gray vertical bars.

**Remarks:** inhabits a variety of habitats including sand or mud bottoms, coral reefs, estuaries and harbours. Mostly caught with trawls.

**Similar families occurring in the area:** Chaetodontidae and Pentacerotidae – mouth not highly pro-

trusible; no notch between spinous and soft-rayed portions of dorsal fin. Ephippidae – pectoral fins short, not reaching past anal-fin base; mouth not protrusible. Scatophagidae – IV anal-fin spines; head profile concave. Monodactylidae – mouth not highly protrusible; pectoral fins shorter than head; eye centered on horizontal axis through mouth. (M. Matsunuma)

#### *Drepane punctata* (Linnaeus, 1758)

##### Spotted Sicklefish

D VIII–X, 20–22; A III, 16–19; P<sub>1</sub> 16–18; LLp 46–50; GR 5 + 10–11. Body oval and strongly compressed, its depth 1.2–1.3 in SL. Mouth highly protrusible, forming a downward-pointing tube when protruded. Caudal fin rounded or bluntly wedged shaped (almost truncate in large adults); pectoral fins elongate, falciform, reaching caudal peduncle. Large adults with a bump or bony knob on interorbital region, a result of hyperostosis of frontal bones. **Color:** generally silvery with a greenish tinge on upper half of body; 5–10 series of black spots arranged in vertical lines on dorsal part of body from below dorsal fin to caudal peduncle. **Size:** maximum length about 40 cm. **Distribution:** temperate and tropical Indo-West Pacific, from Red Sea and east coast of Africa to New Guinea, Samoa, and northern Australia, north to southern Japan. **Remarks:**



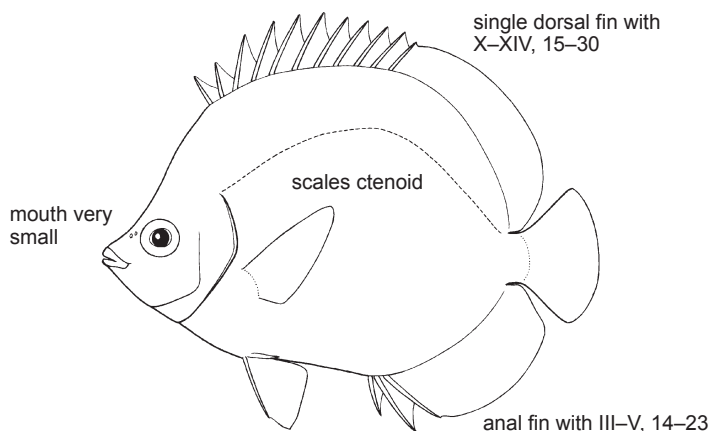
*Drepane punctata*, KAUM–I. 32897, 12.9 cm SL  
Ang Sila, 30 Oct. 2010

occurs in inshore habitats, such as sand or mud bottoms, reefs and estuaries. Feeds on benthic invertebrates. (M. Matsunuma)

## CHAETODONTIDAE

### Butterflyfishes

Small sized (up to 30 cm) marine fishes, with body deep and highly compressed. Head short; preopercle smooth. Eye moderately small, near located on longitudinal axis from tip of snout to middle of caudal fin. Snout highly variable, very short to extremely elongate. Mouth small, terminal, protractile; teeth bristle-like, curved, arranged in rows or bands across jaws; vomer and palatines without teeth. Branchiostegal rays 6 or 7. Gill rakers short. A single dorsal fin, usually with X–XIV strong, stout spines and 15–30 soft rays; no notch between spinous and soft rayed portions of dorsal fin. Anal fin with III–V strong, stout spines and 14–23 soft rays: interspinous membranes deeply incised; margin usually rounded but sometimes angular. Pectoral fin with 13–15 rays. Pelvic fin with I stout spine and 5 soft rays. Caudal fin rounded to slightly emarginate. Scales ctenoid, covering head, body, and median fins; scaly axillary process at upper base of pelvic fins; number of lateral line scales variable, 20–90. Vertebrae 11 + 13.



**Color:** most species very brightly colored with complex and varied color patterns; many species with a dark ocellate “false-eye” spot on posterior portion of body.

**Remarks:** generally found on coral reefs, usually in shallow water above depths of 20–30 m. Feed on coral polyps, colonial sea anemones, tentacles of tubeworms, small crustaceans, zooplankton, and algae. No importance in commercial fisheries; but

commonly treated as an aquarium fish.

**Similar families occurring in the area:** Pomacanthidae – a strong spine at angle of preopercle; most of conspicuous species larger and more colorful. Scatophagidae – dorsal fin with a deep notch; IV anal fin spines; mouth not protractile. Zancidae – strongly produced snout, bony supraocular projections, and only VII dorsal fin spines. (Y. Yusuf)

#### *Heniochus acuminatus* (Linnaeus, 1758)

##### Longfin Bannerfish

D XI, 23–27; A III, 16–19; P<sub>1</sub> 16–17; LLp 49–52. Body very deep; snout moderate, pointed. Lateral line complete. Fourth dorsal-fin spine greatly elongate, filamentous, often exceeding length of body. Caudal fin truncate to slightly rounded. **Color:** overall white, with 2 broad, oblique, black bands on sides, the first continuous with black pelvic fins and the second from middle of spinous portion of dorsal fin to posterior half, but not extending anteriorly to longest soft ray of anal fin; soft dorsal and caudal fins yellow; snout and interorbital largely blackish. **Size:** maximum length about 20 cm. **Distribution:** Indo-Pacific, from East Africa to Hawaii and Society Islands. **Remarks:** inhabits coral reefs at depths of 2–40 m. Occurs singly, in pairs or in small aggregations. Omnivorous. (U. Satapoomin)



*Heniochus acuminatus*, KAUM–I. 33216, 10.4 cm SL off Chanthaburi (SP), 30 Nov. 2010

***Parachaetodon ocellatus***  
(Cuvier, 1831)

Ocellate Coralfish

D VI–VII, 28–30; A III, 18–20; P<sub>1</sub> 14–15; LR 39–46. Body rounded, almost circular; its depth 1.3–1.4 in SL. Dorsal fin triangular in shape and first soft ray at apex. **Color:** head and body pearly white, with five dusky to orange bands; the first band through the eye orange, with black edges; an ocellated black spot in forth body band; band on caudal peduncle with a silver anterior margin; upper portion of dorsal fin mostly yellow. **Size:** maximum length about 17 cm. **Distribution:** eastern Indian Ocean and western Pacific, from Sri Lanka eastward throughout the Indo-Malayan region, and the Great Barrier Reef northward to the Ryukyu Islands, Japan. **Remarks:** inhabits lagoons and coral reefs at depths of 3 to 50 m. Occurs in pairs on flat sand or silty bottoms on coastal reefs. Adults school over open muddy substrates in deep water; juveniles sometimes in large lagoons with seagrasses in depths of about 5 m or more. (Y. Yusuf)



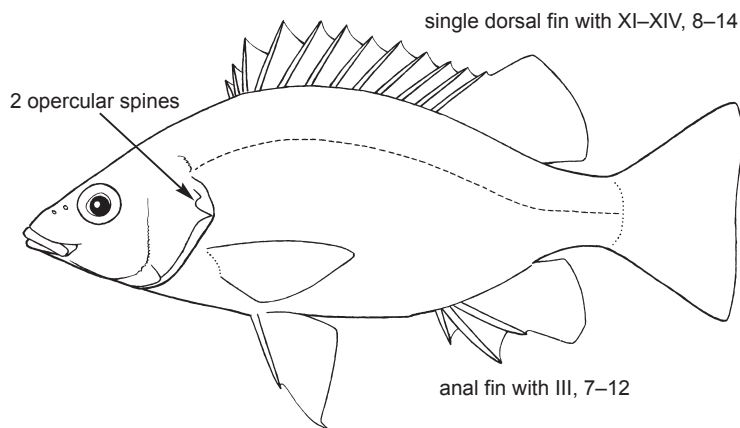
*Parachaetodon ocellatus*, KAUM-I. 32808, 11.1 cm SL  
Gulf of Thailand (SP), 25 Oct. 2010



## TERAPONTIDAE

### Grunters (Tigerperches)

Small to medium-sized (to 35 cm) perch-like fishes. Body oblong and slightly to moderately compressed. Mouth moderate, protractile, upper jaw not extending beyond center of orbit; jaw teeth usually in villiform bands, shape of teeth conical, flattened, or tricuspidate; vomer and palatines toothless in adults of most species. Opercle bearing 2 spines, the lower one larger and stronger; posttemporal bone exposed and expanded posteriorly, with posterior margin serrate in some species. Dorsal fin single, notched, with XI–XIV spines and 8–14 soft rays; anal fin with III and 7–12 soft rays; pelvic fins inserted behind base of pectorals, with I spine and 5 soft rays; caudal fin usually emarginate. Scales adherent, finely ctenoid; lateral line single and complete, reaching on caudal fin. **Color:** body tan or light gray, often silvery in life with various dark



markings; most marine species with 3 or more dark, straight or downwardly curved longitudinal stripes on body; some with dark transverse bands on lobes of caudal fin. **Remarks:** marine terapontids inhabit inshore marine and brackish waters, with some species also entering hypersaline and fresh

waters. **Similar families occurring in the area:** Serranidae – mouth large, with upper jaw typically reaching to below vertical through posterior margin of eye; caudal fin typically rounded; 3 strong spines on opercle. Kuhliidae – dorsal fin with X spines. (M. Matsunuma)

#### *Pelates quadrilineatus* (Bloch, 1790)

##### Fourlined Terapon

D XII–XIII, 9–11; A III, 9–10; LLp 66–75; GR 16–18 + 22–27. Body oblong and compressed laterally. Preopercle serrate; lower opercular spine stronger and longer, but not extending beyond margin of opercular lobe; posttemporal bone not expanded or exposed posteriorly, covered with skin and scales. **Color:** body silvery white, grayish dorsally; 4–6 narrow dark brown or black horizontal stripes on body; spinous portion of dorsal fin with a black blotch dorsally on membranes between third to seventh dorsal-fin spines; a large black blotch on side of body posterior to nape; lobes of caudal fin without prominent transverse black stripes. **Size:** maximum length about 30 cm, commonly to 20 cm. **Distribution:** Indo-West Pacific: Red Sea and East Africa to New Guinea, northern Australia north to Japan. **Remarks:** often found in brackish waters. Feeds on small fishes and invertebrates. (M. Matsunuma)



*Pelates quadrilineatus*, KAUM-I. 32878, 10.6 cm SL  
Gulf of Thailand (SS), 27 Oct. 2010

***Pelates sexlineatus***  
(Quoy & Gaimard, 1824)

Sixlined Terapon

D XI–XII, 9–11; A III, 9–11; P<sub>1</sub> 14–15; LLp 76–87; GR 6–7 + 14–15 (20–22). A small species; body oblong, slightly compressed. Preopercle serrate; lower opercular spine stronger and longer, extending nearly to margin of opercular lobe; posttemporal bone not exposed posteriorly, covered with skin and scales. Teeth, tricuspidate with cusps of nearly equal size, arranged in bands in each jaw. **Color:** body grayish to bluish dorsally, silver to silvery white ventrally; 5 to 8 narrow, dark brown or black horizontal stripes on body, the midlateral stripe extending onto caudal-fin base; a blotch of variable intensity on side of body posterior to nape; caudal fin with dark border. **Size:** maximum total length about 32 cm, commonly between 18 and 24 cm. **Distribution:** Singapore to Australia in the east and south; northwards to China and Okinawa (Japan). **Remarks:** marine inshore water. Feeds on invertebrates and small fishes. (U. Satapoomin)



*Pelates sexlineatus*, KAUM–I. 22859, 10.6 cm SL  
Ang Sila, 31 Aug. 2009

***Terapon jarbua***  
(Forsskål, 1775)

Jarbus Terapon

D XI–XII, 9–11; A III, 7–10; LLp 75–100; GR 6–8 + 12–15. Body oblong and moderately compressed. Preopercle strongly serrate, particularly at angle; lower opercular spine very long and strong, extending distinctly beyond margin of opercular lobe; posttemporal bone expanded, exposed and serrate posteriorly. Caudal fin emarginate. **Color:** body silvery white, grayish dorsally; 3 or 4 dark brown or black downwardly curved longitudinal stripes on body; spinous portion of dorsal fin with a blackish blotch dorsally on membranes between third and sixth spines; both caudal-fin lobes with dark tips and a transverse band. **Size:** maximum length about 35 cm. **Distribution:** Indo-Pacific: East Africa to Samoa, north to southern Japan, south to Australia. **Remarks:** found over shallow sandy bottoms, in the vicinity of river mouths; enters estuaries and rivers.

(M. Matsunuma)



*Terapon jarbua*, KAUM–I. 32677, 9.0 cm SL  
Gulf of Thailand (SS), 22 Oct. 2010

***Terapon puta***  
**Cuvier, 1829**

Small-scaled Terapon

D XI–XII, 9–11; A III, 8–9; LLp 70–85; GR 7–9 + 18–24. A small-sized species; body elongate and laterally compressed. Preopercle strongly serrate, with large spine at angle; lower opercular spine very long and strong, extending distinctly beyond margin of opercular lobe; posttemporal bone expanded, exposed and serrate posteriorly. Caudal fin emarginate. **Color:** body light gray or brown dorsally, tan or silvery white ventrally; 4 straight, narrow dark brown longitudinal stripes on body; spinous portion of dorsal fin with a blackish blotch dorsally between third or fourth and seventh or eighth spines; soft portion of dorsal fin with a black blotch along top of anterior rays; both caudal fin lobes with dark tips and a transverse band. **Size:** maximum length about 15 cm, commonly between 11 and 13 cm.



*Terapon puta*, KAUM–I. 32766, 8.4 cm SL  
Ang Sila, 23 Oct. 2010

**Distribution:** Indo-West Pacific: East Africa to New Guinea and Vanuatu, and north to Philippines. **Remarks:** inhabits inshore waters, sometimes entering brackish and freshwater and mangrove areas. Feeds on small fishes and invertebrates. (M. Matsunuma)

***Terapon theraps***  
**Cuvier, 1829**

Largescaled Terapon

D XI–XII, 9–11; A III, 7–9; P<sub>1</sub> 14–15; LLp 46–56; GR 6–8 + 14–17. Body oblong, moderately compressed. Preopercle serrate, the serrations largest at angle; lower opercular spine very long and strong, extending distinctly beyond margin of opercular lobe; posttemporal bone expanded, exposed and serrate posteriorly. Spinous part of dorsal fin strongly arched and deeply notched; penultimate spine about half length of ultimate spine. Caudal fin emarginate with rounded lobes. **Color:** body dusky dorsally, silvery white ventrally; 4 dark brown horizontal stripes on body; spinous part of dorsal fin with a black blotch dorsally on fin membranes between third and seventh spine; caudal fin with medial rays pigmented; upper lobe of caudal fin with dark tip; both lobes of caudal fin with a dark, trans-



*Terapon theraps*, KAUM–I. 32972, 8.6cm SL  
off Chantha Buri (SP), 1 Nov. 2010

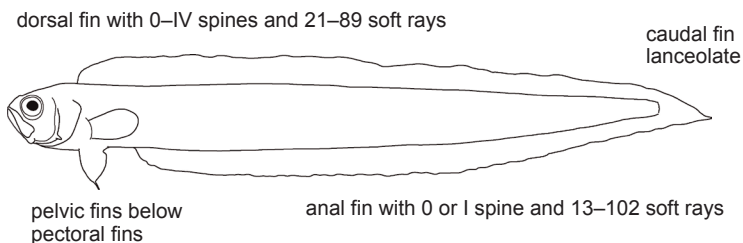
verse band. **Size:** maximum length about 30 cm. **Distribution:** Indo-Pacific, from East Africa and Red Sea to Solomon Islands, northern Australia north to Japan. **Remarks:** found in inshore waters, sometimes entering brackish waters. (M. Matsunuma)



## CEPOLIDAE

### Bandfishes

Small to medium (up to 40 cm) elongate marine fishes. Body moderately to noticeably elongate fishes with compressed, tapering body and lanceolate caudal fin. Head short, with blunt snout. Eyes relatively large and high on head. Mouth large, oblique; upper jaw broad at end, without supramaxilla, and extending to below posterior margin of eye; a single row of slender, slightly curved teeth in jaws with an inner cluster of teeth at symphysis in some species. Dorsal fin continuous, with 0 to IV flexible spines and 21 to 89 segmented rays; anal fin with 0 or I spine and 13 to 102 segmented rays; caudal fin lanceolate, middle 9 to 15 rays branched; pelvic fins positioned below or slightly anterior to pectoral fins, with I spine and 5 segmented rays; outermost segmented pelvic-fin ray unbranched or weakly branched, 4 inner rays distinctly branched. Lat-



eral line high on body, close to dorsal-fin base, terminating posteriorly near end of fin; lateral-line tubes or canals on scales not embedded in skin. Scales cycloid (smooth) or with crenulate margins, relatively large to minute. **Color:** in life red or pink; most species have a distinctive dark stripe on the membrane (usually hidden) connecting the premaxillary and maxillary bones of the upper jaw.

**Remarks:** relatively uncommon fishes taken by trawls in shallow to

deep depths (to at least 475 m). Occurring on level bottom, sand or mud substrates.

**Similar families occurring in the area:** the combination of a lanceolate tail, large oblique mouth, and the arrangement of the pelvic-fin rays, consisting of I spine and 5 segmented rays (the outermost ray unbranched or weakly branched and the inner 4 branched), will distinguish the bandfishes from all other families. (M. Matsunuma)



#### *Acanthocepola abbreviata* (Valenciennes, 1835)

##### Yellowspotted Bandfish

D 64–75; A 63–76; P<sub>1</sub> 16; P<sub>2</sub> I, 5; V 12 + 44–48. Body well elongate and compressed. Head short, with blunt snout; eyes large and high on head; mouth large, oblique; preopercular margin with spines; cheeks scaly. Pelvic fin origin situated slightly anterior to pectoral fin; caudal fin pointed, joined to dorsal and anal fins; 8–10 rays branched. **Color:** head and body

pale pink, reddish dorsally; body with about 4–5 orange spots (same as pupil size) on dorsoanteriorly and about 11–13 indistinct orange vertical bars posteriorly, from mid-point of body to caudal fin base. Dorsal and anal fins reddish yellow, whitish basally; no black markings on dorsal fin; pectoral fin translucent tinged with reddish; pelvic fin white; posterior tip of cau-

dal fin dark red to black. **Size:** maximum length about 30 cm. **Distribution:** eastern Indian Ocean and West Pacific from the Gulf of Oman to northwestern Australia, north to the Philippines. **Remarks:** inhabits mud or sand bottoms of coastal waters. Caught mostly with bottom trawls.

(M. Matsunuma)

*Acanthocepola abbreviata*, KAUM-I. 23820, 17.0 cm SL  
Gulf of Thailand (SS), 25 Sept. 2009

## CICHLIDAE

### Cichlids

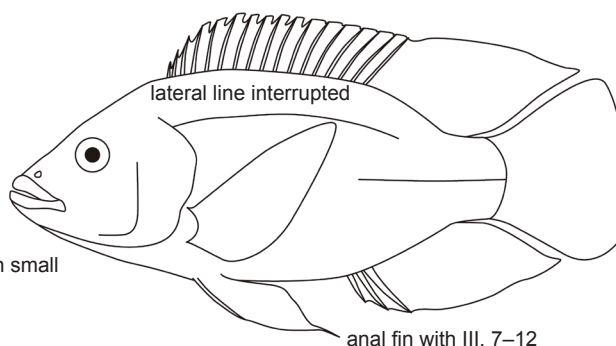
Medium sized fishes, maximum size about 60 cm. Body compressed, depth variable, oblong to rhomboidal. Single nostril on each side of head. Dorsal fin continuous, with XIII–XIX spines and 10–16 soft rays; anal fin with III spines and 7–12 soft rays; pelvic fins with I spine and 5 soft rays; caudal fin rounded or slightly emarginated. Lateral line interrupted with 26–40 scales.

**Color:** highly variable; often with bars or blotches on side.

**Remarks:** found in blackish water or freshwater streams. Frequently utilized as aquarium fish.

**Similar families occurring in**

single dorsal fin with XIII–XIX, 10–16



mouth small

**the area:** Pomacanthidae – a long, cle. Pomacentridae – II anal fin spine strong spine at the corner of preopercles. (T. Yoshida)

### *Oreochromis mossambicus* (Peters, 1852)

Mozambique Tilapia

D XV–XVIII, 11–14; A III, 10–11; LL 30–32; LGR 14–20. Body compressed and deep. Single dorsal fin with moderately long base. Only a single nostril on each side of head. Breeding males with enlarged jaws. Jaws with 3–5 rows of slender teeth, bicuspid in outer row. **Color:** body of adults with silvery olive to deep blue gray. Dorsal and caudal fins with red margins. Caudal fin without distinct narrow vertical bars. Breeding males turn deep greyish black with white lower head and throat. In juveniles, a large ocellus-like marking present at posterior portion of dorsal fin. **Size:** attains about 30 cm SL. **Distribution:** exotic species. Introduced and established in warm temperate to tropical regions in many countries of the world. Naturally distributed in South-eastern Africa. **Remarks:** found in lower river reaches, estuaries, lakes and marshes. well established in brackish water environments in many Southeast Asian countries including Thailand. Food fish. Presumed hybrid individuals possessing intermediate morphology between *O. niloticus* often encountered in brackish water environments in Thailand. Introduced to Thailand in 1851 from Penang, Malaysia. (P. Musikasinthorn)



*Oreochromis mossambicus*, KAUM-I. 23914, 16.4 cm SL  
Mouth of Thachin River, 28 Sept. 2009

***Oreochromis niloticus***  
(Linnaeus, 1758)

Nile Tilapia

D XV–XVII, 10–13; A III, 9–12; LL 30–34; LGR 20–26. Body compressed and moderately deep. Single dorsal fin with moderately long base. Only a single nostril on each side of head. Jaws with 3 to 6 row of teeth. **Color:** body gray with several vertical bars on body side (sometimes indistinct in adults). Several oblique bars on dorsal and anal fins. Caudal fin with several distinct narrow vertical bars. Breeding males with red flush to head, lower body, dorsal and caudal fins. In juveniles, a large ocellus-like marking present at posterior portion of dorsal fin. **Size:** attains about 40 cm SL. **Distribution:** exotic species. Introduced and established in warm temperate to tropical regions of many countries in the world. Naturally distributed in northern and eastern Africa. **Remarks:** found in rivers, lakes and marshes. widely established in freshwater environments in south and southeast Asia. Tolerant to brackish water. Introduced to Thailand in 1965 from Japan. One of the most popular food fishes in Indochina including Thailand. (see also remarks in *O. mossambicus*). (P. Musikasinthorn)



*Oreochromis niloticus*, KAUM–I. 47481, 8.9 cm SL  
Bang Pakong, 23 June 2012

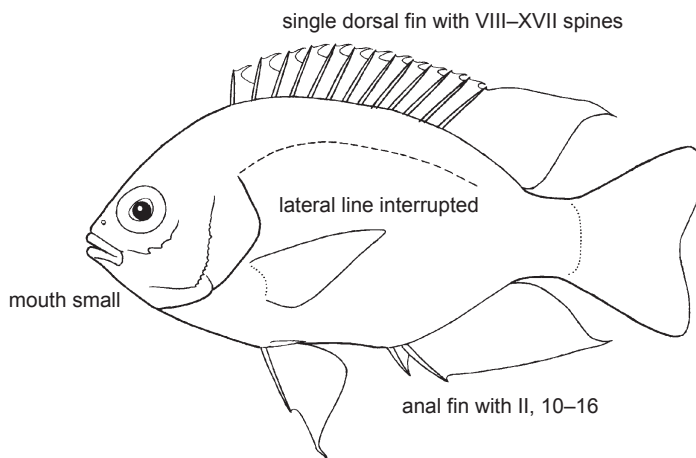


## POMACENTRIDAE

### Damselfishes and Anemonefishes

Small to medium-sized fishes, usually less than 20 cm. Body compressed, ovate to almost circular, covered with ctenoid scales usually extending onto fins; dorsal fin continuous with VIII–XVII spines and no notch; anal fin with II spines and 10–16 soft rays; caudal fin emarginated to forked or lunate. Lateral line interrupted; anterior part of pored scales more or less parallel with dorsal profile and usually ending below soft portion of dorsal fin; posterior part comprising several pits or obscure pores along mid-lateral caudal peduncle; snout usually short and blunt; mouth small, slightly protrac-tile; teeth conical or compressed, uniserial or in 2 or more rows; no teeth on palatine.

**Color:** highly variable; mainly from pale through yellowish, orange, reddish or bluish to blackish; sometimes with blotches, bands, spots, or



other patterns.

**Remarks:** found in coastal waters such as bays, coral reefs and rocky shores, and often enter brackish estuaries or freshwater streams. Frequently utilized as aquarium fish.

**Similar families occurring in the area:** Pomacanthidae – a long, strong spine at the corner of preopercle. Chaetodontidae – elongate, somewhat tube-like snout.

(K. Shibukawa)

### *Abudefduf vaigiensis* (Quoy & Gaimard, 1825)

Indo-Pacific Sergeant

D XIII, 12–14; A II, 11–13; P<sub>1</sub> 16–20; LLp 19–23. Body deep and compressed. Posterior margin of preopercle smooth. Suborbital scaled, with entire ventral margin. Teeth on jaws uniserial, incisor-like. Caudal fin forked; no conspicuous projecting spine-like rays at upper and lower edges of caudal-fin base. **Color:** ground color pale, gradually darkened dorsally on head, with a broad yellow patch on anterodorsal part of body; 5 blackish bars (slightly narrower than paler interspaces) from nape to caudal-fin base; caudal fin transparent or heavily tinged with black (but no pale leading edges). **Size:** 17 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in shallow coral or rocky reefs. (K. Shibukawa)



*Abudefduf vaigiensis*, KAUM-I. 33133, 10.3 cm SL off Chanthaburi (SP), 22 Nov. 2010

***Pristotis obtusirostris***  
(Günther, 1862)

Gulf Damselfish

D XIII, 12–13; A II, 12–14; P<sub>1</sub> 17–18; LLp 19–20. Body depth 2.5–2.8 in SL. Posterior margin of preopercle and subopercle serrated. Both jaws with uniserial teeth. Caudal fin forked without filamentous lobes; no conspicuous projecting spine-like rays at upper and lower edges of caudal-fin base. **Color:** body pale gray to bluish with blue spots on each scale; a small black spot at base of upper pectoral rays. **Size:** 14.0 cm TL. **Distribution:** Indo-West Pacific: Red Sea and Persian Gulf to New Guinea, northern Australia north to Ryukyu Islands, Japan. **Remarks:** inhabits flat sandy or rubble bottoms around patch reefs of lagoons and trawling grounds; depth range 2–80 m. Adults often forming small groups out in the open on sandy substrate, swimming well-above bottom; juveniles often entering shallow estuaries; rare in the area. (Y. Yusuf)

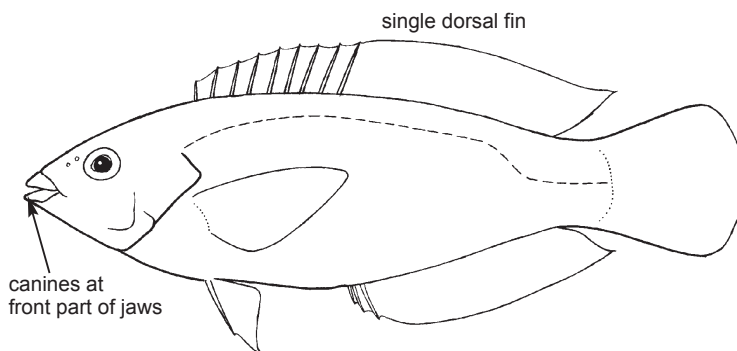


*Pristotis obtusirostris*, KAUM-I. 33008, 9.0 cm SL  
Gulf of Thailand (SS), 3 Nov. 2010

## LABRIDAE

### Wrasses

A diverse group of fishes varying in body shape and size (usually 20 cm); body slightly to extremely compressed. Mouth terminal, slightly to extremely protrusible, usually with prominent lips; maxilla not exposed on cheek; teeth in jaws usually separate and caniniform, the anteriormost 1 or 2 pairs typically enlarged and often directed forward; pharyngeal jaws strong with pharyngeal teeth either sharp, conical, or broad and molariform. A single, long-base dorsal fin in most species, with VIII–XXI spines (usually less than XV) and 6–21 soft rays; anal fin with II–VI spines (often III) and 7–18 soft rays. Scales cycloid and highly variable in size among species; head never fully scaly; lateral line interrupted or continuous. **Color:** most species with bright and intricate color patterns, including stripes, bars, spots, blotches, and ocelli. Most species change color



and sex with growth, from an initial phase (IP) of females, the latter able to change sex into an often brilliantly colored terminal male phase (TP).

**Remarks:** most common in shallow waters in a variety of habitats such as coral reefs, rocky reefs, sand, seagrass, and algae, but rarely found in muddy areas. Wrasses are diurnal with diverse feeding habits, including

benthic invertebrates, fishes, coral mucus, zooplankton, ectoparasites, and algae.

**Similar families occurring in the area:** Scaridae – mouth not protrusible; teeth in jaws coalesced at base or fused into a bony, parrot-like beak, except a few species; lips continuous with facial skin, without an indentation. (U. Satapoomin)

#### *Halichoeres bicolor* (Bloch & Schneider, 1801)

##### Brown-striped Wrasse

D IX, 11–12; A III, 12; P<sub>1</sub> 14–15; LLp 27–28. Body elongate; snout pointed; anterior teeth in upper and lower jaws enlarged to form canines; snout, cheek, opercle, and behind eye naked, scales on nape nearly reaching to a vertical at posterior edge of orbit; lateral line complete; caudal fin rounded. **Color:** ground color of body pale brown to olive in adults, greenish in small juveniles; two brownish black (in juveniles) or reddish brown (in adults) longitudinal stripes on side of body, the upper along back, the lower at mid-lateral from the edge of opercle to caudal fin base. Head with a reddish brown band, edged with blue, on side of snout from mouth to front edge of eye; an upward curved band on cheek below eye; a vertically elongate dark brown spot just behind eye followed by a single (in juveniles) or a pair (in adults) of horizontally elongate spots



*Halichoeres bicolor*, KAUM-I. 24005, 10.4 cm SL  
Bang Sean, 1 Oct. 2009

(as double thick dashes). Dorsal and anal fins pinkish gray, each with 2 longitudinal series of pale to yellowish spots on soft rayed portion; in adult males elongate black spot, leaved anteriorly with bright yellow marking, present between 5th and 8th dorsal fin spines; in juveniles an ocellated black spot present between 1st and 3rd dorsal spines. Caudal fin with several ir-

regular vertical rows of pale yellow spots; an ocellated black spot slightly above the middle of caudal fin base is distinct in juveniles. **Size:** maximum length about 12 cm. **Distribution:** Indo-Malayan region to Sri Lanka. **Remarks:** found in inshore, usually silty habitat on sand or mud near shallow reefs and seagrass beds.

(U. Satapoomin)



*Iniistius evides*

(Jordan &amp; Richardson, 1909)

## Blackspot Razorfish

D IX, 12; A III, 12; P<sub>1</sub> 12; LLp 19–20 + 4–5; GR 18–19. Body deep, compressed, width about 3 in body depth. Dorsal profile of head strongly convex in front of eye; snout nearly vertical, anterior edge thin. Mouth small, lower jaw slightly projecting, a pair of large, slender, recurved, laterally flaring canines at front of each jaw extending well beyond lips when mouth closed. Origin of dorsal fin above posterior edge of orbit; dorsal fin deeply incised between 2nd and 3rd spines; first two dorsal spines flexible and curved, not longer than longest dorsal soft rays; caudal fin rounded. Lateral line interrupted; small scales on cheek in about 9 irregular oblique rows, with about 8 scales in upper row, narrowing to 2 in lowermost row behind corner of mouth. **Color:** generally gray to pale yellowish, shading to white ventrally;



*Iniistius evides*, KAUM-I. 23437, 16.6 cm SL  
Gulf of Thailand (SS), 24 Sept. 2009

white-edged black spot over 8th lateral-line scale and 1 to 4 scales above, but not reaching dorsal edge of body; yellowish patch on anterior side, from hind part of gill opening to above pectoral-fin region; fins pale yellowish.

**Size:** maximum total length about 19 cm. **Distribution:** East coast of Malay Peninsula to southern Japan (Ryukyu Islands). **Remarks:** found in open sand areas near reefs in depths as shallow as 5 m. (U. Satapoomin)

*Iniistius trivittatus*

(Randall &amp; Cornish, 2000)

## Triplebar Razorfish

D IX, 12; A III, 12; P<sub>1</sub> 12; LLp 19–20 + 4–5; GR 14–16. Body deep, very compressed, width 3.0–3.5 in body depth. Dorsal profile of head strongly convex in front of eye; snout nearly vertical, anterior edge a sharp ridge; chin also with a sharp anterior ridge. Mouth small, lower jaw slightly projecting, a pair of long slender slightly incurved canines at front of each jaw extending well beyond lips with mouth closed. Origin of dorsal fin above posterior edge of orbit; dorsal fin incised between 2nd and 3rd spines; dorsal spines slender and flexible, 1st and 2nd spines not longer than longest dorsal soft rays; caudal fin rounded. Lateral line interrupted; head naked, except for 2–3 scales dorsally on opercle and a broad zone of small scales on cheek in about 8 irregular oblique rows. **Color:** body



*Iniistius trivittatus*, KAUM-I. 33158, 13.7 cm SL  
Gulf of Thailand (SS), 25 Nov. 2010

pale yellowish gray, whitish ventrally; 3 blackish bars on upper half of body; a median pale blue line on forehead; a pink margin on dorsal and anal fins and dorsal edge of caudal fin. **Size:** maximum total length about 16 cm.

**Distribution:** presently known from South China Sea, north to Hongkong and Taiwan, south to east coast of Malay Peninsula. **Remarks:** found on sandy bottoms in coastal waters. (U. Satapoomin)

***Leptojulis lambdastigma***  
**Randall & Ferraris, 1981**

D IX, 12–13; A III, 11–12; P<sub>1</sub> 13; LLp 27; GR 16–20. Body slender; head pointed; dorsal profile of head nearly straight, nape slightly convex; snout relatively long; eye small. Mouth terminal, slightly oblique; front of jaws with 2 pairs of large canines; a prominent canine tooth posteriorly on upper jaw. Lateral line complete; body covered with large cycloid scales, head and bases of fins except for caudal fin naked. Caudal fin rounded; first pelvic fin ray elongate, especially in large male. **Color:** body and head pale pink, whitish ventrally; yellow stripe on body side extending from upper lip to caudal-fin base, via eye; a large V-shaped black marking on nape. Dorsal fin pale orange; upper half of soft-rayed portion of fin pale blue, with a broad pale yellow band submarginally; lower portion of dorsal fin with a



*Leptojulis lambdastigma*, KAUM-I. 33230, 12.5 cm SL  
 off Chanthaburi (SP), 30 Nov. 2010

row of yellow blotches with a pale blue margin on membranes anteriorly, forming a zigzag stripe posteriorly. Anal fin pale orange, dusky yellow distally, with a thin light blue margin; a row of yellow spots along base. Pectoral and pelvic fins translucent. Caudal fin white, pale blue distally, black-

ish marginally, numerous scattered yellow spots. **Size:** maximum length about 14 cm. **Distribution:** Western Central Pacific including Taiwan, Philippines, and Gulf of Thailand. **Remarks:** found in coastal waters of sand bottoms. (M. Matsunuma)

***Xiphocheilus typus***  
**Bleeker, 1856**

**Bluebanded Wrasse**

D XII, 8; A III, 10; P<sub>1</sub> 15–17; LLp 29. Body slender; dorsal profile of head convex, head and snout blunt. Jaws prominent; upper jaw with 2 widely separated prominent anterior canines; 1 or 2 pair large curved canines on upper jaw posteriorly; lower jaw also with 2 large anterior canines. Pelvic fin short, reaching anus only in large specimens; caudal fin slightly rounded to double emarginate in adults. Lateral line complete; bases of dorsal and anal fins naked; 7–10 large predorsal scales, extending in front of dorsal fin to center of eye; cheek and opercle scaled. **Color:** head and body olive-green dorsally, orange or pinkish laterally; sides with numerous narrow oblique blue bands; head with 4 or 5 narrow blue bands or stripes outlined with yellow-orange;



*Xiphocheilus typus*, KAUM-I. 23090, 10.4 cm SL  
 Gulf of Thailand (SS), 6 Sept. 2009

dorsal fin blue with 2 or 3 narrow orange or pink stripes; anal fin yellow-orange with numerous narrow blue bands basally; caudal fin yellow-orange with about 5–8 narrow blue bands; pectoral fins transparent to orangish with a blue band on base.

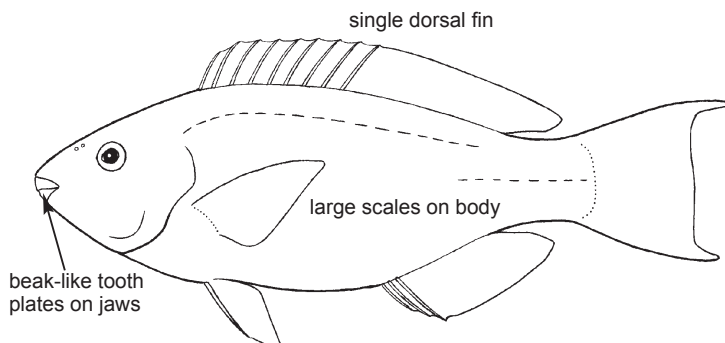
**Size:** maximum length about 12 cm. **Distribution:** eastern Indian Ocean and western Pacific. **Remarks:** inhabits coral reefs at depths of 35 to 85 m. Caught mostly with bottom trawls.

(M. Matsunuma)

## SCARIDAE

### Parrotfishes

Medium to large sized (up to 120 cm) fishes. Body oblong, moderately deep. Head generally bluntly rounded anteriorly. Teeth in jaws usually fused to form a pair of beak-like plates in each jaw, but a few species have free, imbricate, incisor-like teeth; small, isolated, projecting teeth (canines) occur in some species on outer sides of upper jaw; pharyngeal dentition strong consisting of interdigitating paired upper pharyngeals with rows of elongate molariform teeth; these teeth bear against the elongate molariform teeth on the surface of the single lower pharyngeal bone. Dorsal fin with IX slender, flexible spines and 10 soft rays; anal fin with III flexible spines and 9 soft rays; pectoral fins with 2 unbranched rays and 11–14 branched rays; pelvic fins with I spine and 5 soft rays; caudal fin with 11 branched rays, varying from rounded to lunate with produced caudal fin lobes. Scales large, cycloid, usually 22–24 on lateral line; 1–4 rows of scales on cheek; 2–8 median predorsal scales. **Color:** most species very colorful;



may exhibit striking sexual dichromatism. Most species are protogynous hermaphrodites (maturing first as females, then sexually transforming into males), this sexual transformation is usually accompanied by change in color phase. In species where 2 adult color phases are known the first is termed "initial phase" (IP), the second "terminal phase" (TP).

**Remarks:** parrotfishes are most often found on or in vicinity of coral reefs, and usually most abundant in shallow waters to a depth of 30 m. Herbivorous, usually scraping algae

from dead coral substrates. Bits of rock eaten with the algae are crushed into sand and ground with the algae to aid in digestion, making parrotfish some of the most important producers of sand on coral reefs.

**Similar families occurring in the area:** the beak-like plates of most scarids, in addition to features such as large smooth scales and often bright colors, usually preclude parrotfishes being confused with any other fish family. (M. Matsunuma)

#### *Scarus ghobban* Forsskål, 1775

##### Yellowscale Parrotfish

D IX, 10; A III, 9; P<sub>1</sub> 15–16 (usually 15); PDS 5–7 (6). Teeth fused to form dental plates; dental plates relatively smooth; lips covering more than half of dental plates; large adults with 1–3 canine teeth on side at rear of upper dental plate; usually 3 rows of scales on cheek; caudal fin slightly emarginate in small initial-phase fish to lunate in large terminal males. **Color:** initial phase dull orange yellow, centers of scales bluish; 5 irregular blue bars often present on body; fins yellowish. Terminal males green dorsally, scales rimmed with salmon pink, shading to pale green ventrally with pale salmon pink bar on each scale; head green



*Scarus ghobban*, KAUM-I. 47426, 20.0 cm SL  
off Tha Chana (SP), 18 June 2012

dorsally, shading to pale salmon on cheek and chin, with 2 transverse blue bands on chin and 3 narrow irregular green bands extending posteriorly from eye. **Size:** maximum length

about 75 cm. **Distribution:** widespread Indo-Pacific and tropical eastern Pacific. **Remarks:** found on coral reefs to at least 30 m depth.

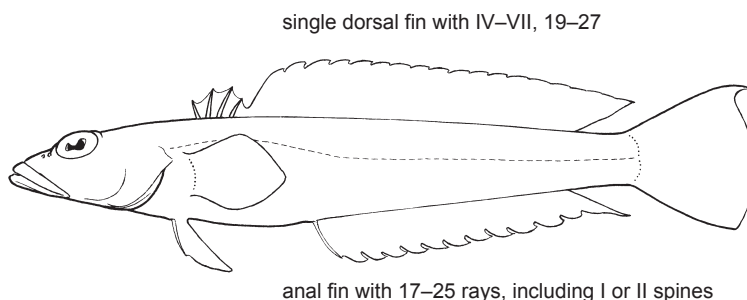
(M. Matsunuma)



## PINGUIPEDIDAE

### Sandperches

Small to large-sized fishes. Body elongate, cylindrical anteriorly (except *Prolatilus*, having rather deeper body). Eye moderate. Snout slender. Teeth small, in band in jaws. Vomer with V-shaped tooth patch (teeth absent in *Prolatilus*). Palatine teeth present or absent. Gill membranes united, free from isthmus. Dorsal fin single, with 4–7 short spines and 19–27 soft rays. Anal fin with 17–25 rays, including 1 or 2 weak spines anteriorly. Caudal fin usually with 15 branched rays. Pelvic fin with 1 spine and 5 soft rays. Vertebrae 30–37. Several species of *Parapercis* have been shown to be protogynous hermaphrodites (thus females change to males). **Color:** variable (e.g., dark, pale brownish, and reddish), many



single dorsal fin with IV–VII, 19–27

anal fin with 17–25 rays, including I or II spines

species with distinct and characteristic markings; some change in the color pattern with the sex change is usually known in *Parapercis*.

**Remarks:** five genera are known

from the world; only *Parapercis* is distributed in the area.

**Similar family occurring in the area:** Percophidae – 2 dorsal fins present. (H. Imamura)

#### *Parapercis alboguttata* (Günther, 1872)

##### Bluenose Sandperch

D V, 22; A I, 19; P<sub>1</sub> 17–19; LLp 57–60. Body cylindrical, caudal peduncle slender. Three pairs of canine teeth on lower jaw anteriorly. Palatine teeth absent. Third dorsal spine longest. Spinous dorsal connected by membrane to 1st soft ray near base. **Color:** body pale red dorsally, whitish ventrally; 2 longitudinal rows of indistinct light red blotches on body, ending in 2 distinct dark red spots on caudal-fin base; snout light blue with oblique yellow lines. **Size:** maximum length about 27 cm. **Distribution:** Indo-West Pacific, including the Arabian Gulf, South China Sea, Indonesia, Philippines and northwestern Australia. **Remarks:** usually taken by trawling at depths from 50 to 120 m. (H. Imamura)



*Parapercis alboguttata*, KAUM-I. 23793, 20.2 cm SL  
Gulf of Thailand (SS), 25 Sept. 2009

***Parapercis filamentosa***  
(Steindachner, 1878)

Threadfin Sandperch

D V, 22; A I, 18; P<sub>1</sub> 16; LLp 58–59. Body cylindrical. Three pairs of canine teeth on lower jaw anteriorly. Palatine teeth absent. Middle dorsal spines longest. Membrane from spinous dorsal connected by membrane to 1st soft ray near base. First few dorsal soft rays greatly elongated. **Color:** body light brown dorsally with 6 faint V-shaped brown markings, whitish ventrally; pelvic fin dusky; upper caudal fin base with a dark spot. **Size:** maximum total length about 18 cm. **Distribution:** West Pacific, including Singapore, Thailand, Hainan, Java and Borneo, Malaysia. (H. Imamura)



*Parapercis filamentosa*, KAUM-I. 33177, 9.8 cm SL  
Gulf of Thailand (SS), 25 Nov. 2010

***Parapercis xanthozona***  
(Bleeker, 1849)

Yellowbar Sandperch

D V, 21; A I, 17; P<sub>1</sub> 17; LLp 56–60. Body cylindrical, caudal peduncle slender. Three pairs of canine teeth on lower jaw anteriorly. Palatine teeth usually absent. Third and/or fourth dorsal spine longest. Spinous dorsal connected by membrane to 1st soft ray nearly at level of last spine tip. **Color:** body pale brown; 1 longitudinal row of paler band and 9 brownish vertical bars on body; cheek with oblique white lines in males; caudal fin with a white marking. **Size:** attains about 23 cm. **Distribution:** Indo-West Pacific, including Japan, South China Sea, Philippines and northeastern Australia. (H. Imamura)

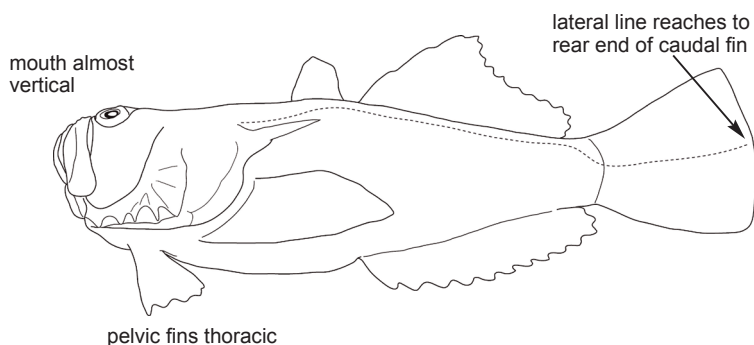


*Parapercis xanthozona*, KAUM-I. 23431, 12.2 cm SL  
Gulf of Thailand (SS), 24 Sept. 2009

## URANOSCOPIDAE

### Stargazers

Medium sized (up to 65 cm) marine fishes. Body moderately elongate, depressed anteriorly or compressed. Head massive, nearly cube-shaped, flattened dorsally, rounded anteriorly; dorsal and lateral surfaces of head almost entirely encased in sculptured bones. Eyes directed dorsally or dorsolaterally, placed on or near top of head. Infraorbital bones dilated. Interorbital space noticeably broad, anterodorsal part of skull deeply scooped backward (interorbital fossa). Mouth large, protractile, almost vertical; jaws, prevomer, and palatines toothed; a pair of pockets on anterior roof of mouth (between premaxillae and prevomer). A peculiar dermal appendage present at central tip of respiratory valve inside lower jaw in *Uranoscopus* and young of *Gennyagnus*. Branchiostegals 6. First gill arch with gill teeth instead of typical gill rakers; pseudobranchiae present. Membranes of anal, pelvic, and pectoral fins fleshy and thickened. Dorsal fin single with 0–IV rudimentary spines and 12–20 soft rays or divided with IV or V weak spines and 13 or



14 soft rays; anal fin with 13–19 soft rays; caudal fin subtruncate, with 10 or 11 branched rays; pectoral fin broad, “squarish”, or knife-shaped, with 13–25 rays; pelvic fin close together, situated on throat and in advance of pectoral fins, with I non-visible weak spine and 5 segmented rays. Body naked or covered with adherent, cycloid scales almost embedded under the skin; lateral line complete, reaching onto caudal fin margin. **Color:** generally brownish dark with dark or pale spots or mottling on body.

**Remarks:** stargazers are noctur-

nal and during the day bury their body into sand or mud, with only the eyes and mouth cleft protruding from the substrate. Caught mostly with bottom trawls.

**Similar families occurring in the area:** Batrachoididae – gill openings small, restricted to sides of body (gill openings wide in Uranoscopidae); pelvic fins with I distinct spine and 5 soft rays (with I non-visible weak spine and 5 soft rays in Uranoscopidae). Champsodontidae – body smaller, more compressed; caudal fin forked. (M. Matsunuma)

#### *Uranoscopus cognatus* Cantor, 1849

##### Twospined Yellowtail Stargazer

D III + 14–15; A 13–14; P<sub>I</sub> 16–17. Body moderately elongate; head massive; short cirri on eye; respiratory valve inside lower jaw with a thread-like appendage. Preopercle with 4 spines on lower edge; supracleithrum not forming distinct spine at rear end; 2 basipterygial processes. **Color:** head and body brown dorsally, finely mottled and stippled dark brown; dusky white laterally, white ventrally. First dorsal fin black; second dorsal fin translucent, rays tinged with blowfish; pectoral fin translucent; posterior half of fin yellow with white margin; pel-



*Uranoscopus cognatus*, KAUM-I. 32820, 11.3 cm SL  
Gulf of Thailand (SP), 25 Oct. 2010

vic fin white; caudal fin pale yellow, dusky distally. **Size:** maximum length about 22 cm. **Distribution:** eastern Indian Ocean and West Pacific from In-

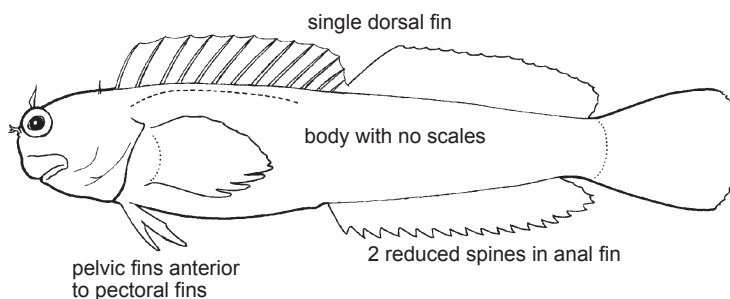
dia east to northern Australia, south to the Philippines. **Remarks:** caught mostly with bottom trawls in depths of 50–250 m. (M. Matsunuma)



## BLENNIIDAE

### Blennies (Combtooth Blennies, Sabertooth Blennies)

Small, scaleless, often elongate fishes (most species much less than 15 cm). Head usually blunt, often with cirri on eyes, nasal openings, nape, and/or cheeks; gill openings continuous across lower surface of head or restricted to small opening on each side of head. Upper jaw not protractile; teeth incisor-like in single row in each jaw, often very fine and loosely attached; canine teeth occasionally present; no teeth in palatines; vomerine teeth present or absent. Dorsal fin continuous or notched, usually with more segmented rays than spines (III–XVII flexible spines and 9–119 segmented soft rays); anal fin with II spines, often indistinguishable; segmented caudal fin rays 10–14; pelvic fins in advance of pectoral fins, pelvic fin spine not visible externally, soft rays fewer than 5, sometimes deformed or absent. **Color:** very variable, dull to brilliant, full spectrum; often mottled, with irregular vertical bands or stripes, some species almost uniform.



**Remarks:** mostly bottom dwelling species in sea and estuaries, usually at depths much less than 20 m, mostly among rocky, oyster, or coral reefs, often in tide pools. Feeding on a mixed diet of algae and benthic invertebrates; some are planktivores, and some are specialized to feed on skin or fins of larger fishes, with mimic as cleaner. **Similar families occurring in the area:** Clinidae – body with fine, embedded cycloid scales; scales with radii in all fields; many more dorsal fin spines than segmented rays; jaw

teeth in more than 1 row. Tripterygiidae – body with ctenoid scales; dorsal fin clearly divided into 3 parts; many more dorsal fin spines than rays; jaw teeth in more than 1 row. Gobiidae and Eleotridae – body usually scaly; pelvic fins usually with I spine and 5 soft rays; dorsal fin in 2 well-separated sections, the spinous portion with less than VIII spines, the segmented ray portion with I spine at beginning.

(K. Shibukawa & H. Imamura)

#### *Omobranchus ferox* (Herre, 1927)

D XI–XIII, 20–23; A II, 20–26; P<sub>1</sub> 13; P<sub>2</sub> I, 2. Body elongate and compressed. No cirri on head. Fleshy crest on top head absent in both sexes. Gill opening narrow, restricted on side of head. Dorsal fin continuous, without distinct notch between spinous and segmented-ray portions. Caudal fin usually with 13 segmented rays, all of them unbranched. **Color:** head and body olive green, typically with several vague dusky bars on body; a short, narrow vertical black band just behind eye (preceded by white vertical line when alive or fresh); a dusky spot frequently found around end of dorsal fin in male. **Size:** 6 cm. **Distribution:** Indo-West Pacific. **Remarks:** found in mangrove swamps and estuaries.

(K. Shibukawa)



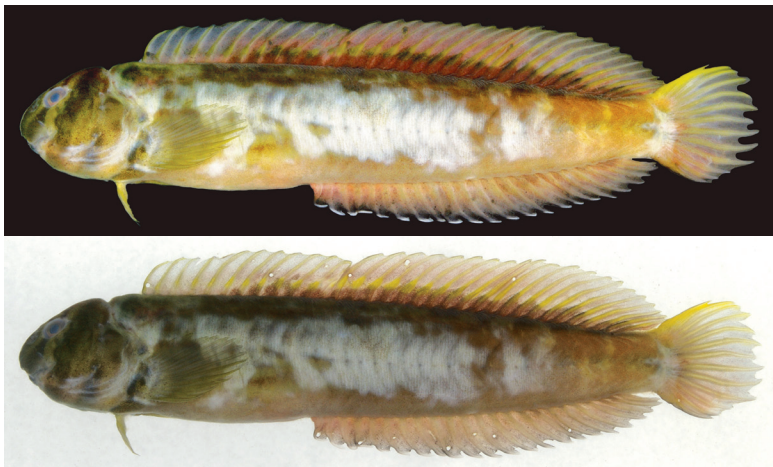
*Omobranchus ferox*, KAUM-I. 24002, 5.0 cm SL  
Bang Sean, 1 Oct. 2009

***Omobranchus punctatus***  
(Valenciennes, 1836)

Muzzled Blenny

D XI–XIII, 19–24; A II, 22–26; P<sub>1</sub> 13; P<sub>2</sub> I, 2. Body elongate and compressed. No cirri on head. Fleshy crest on top head absent in both sexes. Gill opening narrow, restricted on side of head. Dorsal fin continuous, without distinct notch between spinous and segmented-ray portions. Caudal fin usually with 13 segmented rays, all of them unbranched. **Color:** ground color of head and body brownish olive; head with broad dusky vertical bands; body with several irregular, horizontal dusky lines anteriorly. **Size:** 9 cm. **Distribution:** Indo-Pacific; also introduced to Western Atlantic. **Remarks:** found in mangrove swamps, brackish estuaries and adjacent waters.

(K. Shibukawa)



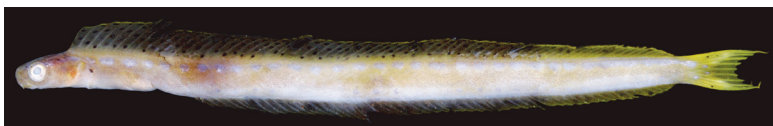
*Omobranchus punctatus*, KAUM–I. 24004, 6.4 cm SL  
Bang Sean, 1 Oct. 2009

***Plagiotremus spilistius***  
Gill, 1865

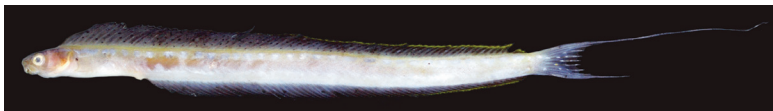
Slender Fangblenny

D X, 58–60; A II, 55–57; P<sub>1</sub> 12. Body greatly elongate, eel-like. Snout rounded; mouth inferior; gill opening restricted, extending ventrally to a level of base of upper pectoral-fin rays. Dorsal fins continuous, with no distinct notch between spinous and segmented-ray portions. Pelvic fins absent in adult. Caudal fin with 11 segmented rays (all unbranched); outer lobes of caudal fin elongate and filamentous. **Color:** body yellowish brown, with two longitudinal series of small dark spots; a small black spot at upper part of pectoral-fin base; dorsal and anal fins dusky, with numerous small black spots. **Size:** 16.4 cm SL. **Distribution:** South China Sea and Gulf of Thailand. **Remarks:** caught with trawls from sandy or sandy-mud bottom.

(K. Shibukawa)



*Plagiotremus spilistius*, KAUM–I. 23807, 9.6 cm SL  
Gulf of Thailand (SS), 25 Sept. 2009



*Plagiotremus spilistius*, KAUM–I. 23808, 12.6 cm SL  
Gulf of Thailand (SS), 25 Sept. 2009



*Xiphasia setifer*, KAUM–I. 23459, 40.9 cm SL  
Gulf of Thailand (SS), 24 Sept. 2009

***Xiphasia setifer***  
Swainson, 1839

Hairtail Snakeblenny

D XIII–XIV, 105–119; A II, 107–119; P<sub>1</sub> 12–14; P<sub>2</sub> I, 3; V 15–16 + 105–119 = 121–135. Body extremely elongate, ribbon-like. No cirri, tentacles or crest on head. A large canine tooth on each side of lower jaw anteriorly. Gill opening restricted to side of head. Origin of dorsal fin over anterior part of eye. Caudal fin rounded, continuous with dorsal and anal fins, the middle 2 rays elongated as filament in males; no caudal-fin rays branched. **Color:** body light brown with 24–28 broad brown bars on body, extending into

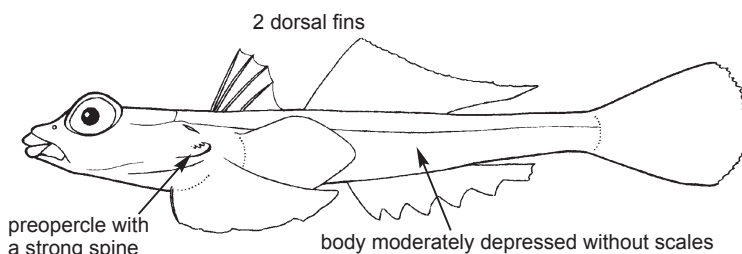
dorsal fin; a black spot or ocellus usually present distally in dorsal fin between 5th and 7th dorsal spines; margin of dorsal fin broadly blackish. **Size:** attaining to ca. 55 cm. **Distribution:** Indo-West Pacific, including the Red Sea, Andaman Sea, southern Japan, Great Barrier Reef and New Caledonia. **Remarks:** inhabits muddy bottoms in bays and shallow waters.

(H. Imamura)

## CALLIONYMIDAE

### Dragonets

Small to moderate-sized (up to 45 cm), depressed benthic fishes. Body elongate, depressed or sub-cylindrical. Head usually wide and well depressed, triangular when seen from above in many species; gill opening restricted to a small dorsal or sublateral pore; preopercle with a strong spine; no spines on opercle and subopercle; jaw with villiform teeth; no teeth on roof of mouth; upper jaw greatly protractile. Two dorsal fins, comprising spinous (with III–V spines; rarely absent) and soft (with 7–10 soft rays) portions; anal fin with 6–10 soft rays; pelvic fins thoracic, with I spine and 5 soft rays. No scales on head and body. **Color:** highly variable, but dull sandy-colored in many species, e.g., head and body grayish or brownish dorsally, whitish ventrally, mottled and/or



spotted with paler colored spots; some have entirely reddish body (especially in deep-water species) or several vivid color with complex patterns on head, body and fins.

**Remarks:** found in seagrass beds, bays, coral reefs, estuaries, and shelf waters, and commonly found on sandy or muddy bottoms. Locally utilized as food fish.

**Similar families occurring in the**

**area:** Eleotridae – usually no preopercular spine; gill opening wide; scales on body. Gobiidae – usually no preopercular spine; pelvic fins fused medially one another in many species; gill opening wide. Platycephalidae – mouth large, lower jaw projecting beyond upper jaw; short spines, serrae and/or bony tubercles on the head; gill opening wide; scales on body. (K. Shibukawa)

### *Calliurichthys japonicus* (Houttuyn, 1782)

#### Japanese Longtail Dragonet

D IV + 9; A 8; P<sub>1</sub> 18–21. Head and body compressed. A pair of small bony bumps on dorsal surface of head behind eye. Preopercular spine slender and straight, with several serrae along its dorsal margin. Transverse canal branch connecting opposite lateral line canals present on caudal peduncle. Anterior two spine of first dorsal fin elongate and filamentous in large male. All but posteriormost one segmented rays of second dorsal fin unbranched. Caudal fin very long. **Color:** head and body light grayish brown dorsally, pale ventrally; a distinct black spot between third and fourth



*Calliurichthys japonicus*, KAUM-I. 33151, 12.8 cm SL  
off Chantha Buri (SP), 22 Nov. 2010

spine of first dorsal fin; a broad submarginal black stripe on anal fin. **Size:** attaining to ca. 55 cm. **Distribution:** West Pacific. **Remarks:** inhabits sandy-mud bottoms at the depths of 10–200 m. Generic assignment follows Nakabo (1982). (K. Shibukawa)



***Dactylopus dactylopus***  
(Valenciennes, 1837)

Fingered Dragonet

D IV + 8; A 7; P<sub>1</sub> 19. Body subcylindrical or slightly compressed posteriorly. No transverse canal branch connecting opposite lateral line canals on caudal peduncle. Dorsal fin spines elongate and filamentous in male. All rays of second dorsal fin branched. Spine and first ray of pelvic fin connected together, free from other rays.

**Color:** head and body grayish brown brownish dorsally, pale ventrally; numerous pale and dusky spots on body. **Size:** 25 cm SL. **Distribution:** eastern Indian Ocean and West Pacific. **Remarks:** inhabits sandy-mud bottoms in shallow coastal waters, particularly seagrass beds. (K. Shibukawa)



*Dactylopus dactylopus*, KAUM-I. 32981, 9.5 cm SL  
off Chantha Buri (SP), 1 Nov. 2010



*Dactylopus dactylopus*, KAUM-I. 33232, 12.5 cm SL  
off Chantha Buri (SP), 30 Nov. 2010

***Repomucenus belcheri recurvispinnis***  
(Li, 1966)

Concave Dragonet

D IV + 9; A 9; P<sub>1</sub> 17–21. Head and body compressed. Preopercular spine straight, with several serrae along its dorsal margin. Transverse canal branch connecting opposite lateral line canals present on caudal peduncle. No filamentous spine of first dorsal fin in both sexes. All but posterior-most one segmented rays of second dorsal fin unbranched. Caudal fin moderate in size. **Color:** head and body light grayish brown dorsally, pale ventrally; lower side of body with a series of short, wavy vertical dusky lines in large male; anal fin with submarginal black stripe in male, a series of black blotches in female. **Size:** 22 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** the generic assignment tentatively follows Nakabo (1982; for *R. belcheri*). Fricke (1983, 2002) treated this as subspecies of *Calionymus belcheri* Richardson, 1844.

(K. Shibukawa)

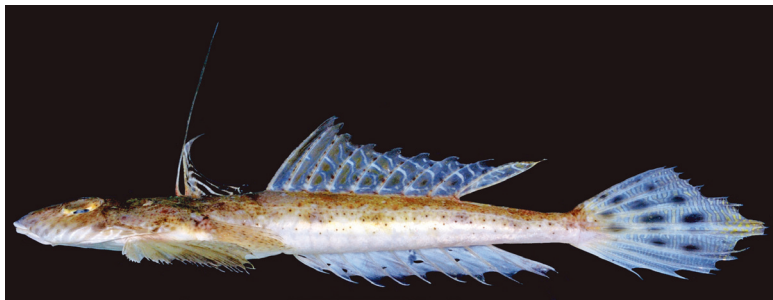


*Repomucenus belcheri recurvispinnis*, KAUM-I. 23839, 9.8 cm SL  
Gulf of Thailand (SS), 25 Sept. 2009

***Repomucenus filamentosus*  
(Valenciennes, 1837)**

Blotchfin Dragonet

D IV + 9; A 9; P<sub>1</sub> 15–20. Body depressed; transverse canal branch connecting opposite lateral line canals on dorsal part of caudal peduncle. Head depressed; distal tip of preopercular spine not inwardly curved. All rays of second dorsal and anal fins unbranched, except for last rays divided to the base; first dorsal-fin spine long, filamentous and free from the rest of the fin in male, while not filamentous in female. **Color:** head and body brown dorsally, whitish ventrally; a series of black spots on midlateral body; anal fin whitish, may be blackened distally; caudal fin with large black spots. **Size:** 15 cm. **Distribution:** Indo-West Pacific; immigrated from Red Sea to eastern Mediterranean through Suez Canal (Fricke, 2001). **Remarks:** found on sandy bottoms. Generic assignment follows Nakabo (1982). (K. Shibukawa)



*Repomucenus filamentosus*, KAUM-I. 24067, 12.1 cm SL  
Gulf of Thailand (SS), 5 Oct. 2009



*Repomucenus meridionalis*, KAUM-I. 33164, 11.8 cm SL  
Gulf of Thailand (SS), 25 Nov. 2010

***Repomucenus meridionalis*  
(Suwardji, 1965)**

Highfin Dragonet

D IV + 8–9; A 9; P<sub>1</sub> 19–22. Body depressed; transverse canal branch connecting opposite lateral line canals on dorsal part of caudal peduncle. Head depressed; distal tip of preopercular spine inwardly curved; in addition to the distal tip, only a single dorsal point on preopercular spine. All rays of second dorsal and anal fins unbranched, except for last rays divided to the base; first dorsal-fin spine greatly elongate, with a filamentous tip. **Color:** head and body brown dorsally, whitish ventrally; a series of indistinct black spots on midlateral body; first dorsal fin whitish, with many irregular diagonal dusky lines; anal fin blackish, with a narrow whitish distal margin; caudal fin with small black spots. **Size:** 15 cm. **Distribution:** Western Pacific. **Remarks:** found on sandy or muddy bottoms. (K. Shibukawa)



*Repomucenus planus*, KAUM-I. 33167, 8.7 cm SL  
Gulf of Thailand (SS), 25 Nov. 2010

***Repomucenus planus*  
(Ochiai, 1955)**

Japanese Darter Dragonet

D IV + 9; A 9; P<sub>1</sub> 18–22. Head and body compressed. Preopercular spine with 3–6 serrae along its dorsal margin and curved posteriormost tip. Transverse canal branch connecting opposite lateral line canals present on caudal peduncle. First dorsal fin small, without filamentous spine in both sexes. All but posteriormost one segment-

ed rays of second dorsal fin unbranched. **Color:** head and body light yellowish brown dorsally, pale ventrally, with numerous, dense dark brown dots; first dorsal fin largely blackish in female; many white spots on second dorsal fin in male. **Size:** 10 cm SL. **Distribution:** West Pacific. **Remarks:** inhabits sandy bottoms in shallow coastal waters. The generic assignment follows Nakabo (1982). (K. Shibukawa)

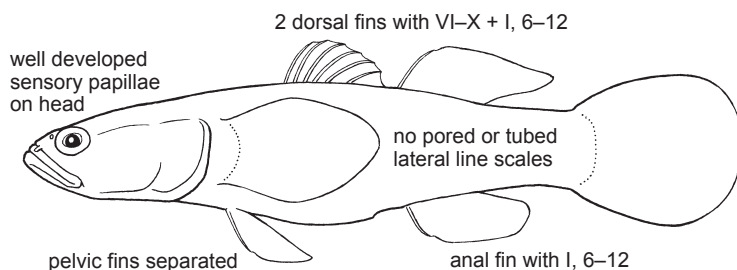
## ELEOTRIDAE

### Sleepers

Small to moderate sized fishes (up to ca. 85 cm, commonly to 20 cm), bottom-oriented fishes. Body moderately elongate, more or less compressed posteriorly; no pored or tubed lateral-line scales on body. Teeth usually conical, forming some or more rows in each jaw; sensory-papillae rows well developed on head (and few on body and caudal fin); branchiostegals 6. Two dorsal fins, first one with VI–X flexible spines, second one with I spine and 6–12 soft rays; pelvic fins separated, innermost or preceding rays longest; pelvic fin usually with I spine and 5 soft rays.

**Color:** highly variable, typically blackish or grayish brown with dusky mottles, whereas some species has brilliant color with e.g., bright yellow and/or red spots.

**Remarks:** typically found in fresh and brackish waters, whereas



some found in coral reefs. Carnivorous. Large species often esteemed as food fish; some freshwater colorful species often treated as aquarium fish.

**Similar families occurring in the area:** Blenniidae – single dorsal fin; teeth incisor-like, forming single row in each jaw. Callionymidae – preopercle with a strong spine; no scales on body; gill opening restricted to a small dorsal or dorsolateral pore. Gobiidae – pelvic fins fused medially one another

in many species; five branchiostegal rays. Platycephalidae – many short spines or bony tubercles on head; no spines on second dorsal and anal fins. Ptereleotridae – bottom-oriented, free swimming fishes, with elongate (but not eel-like) and compressed head and body; five branchiostegal rays. Tripterygiidae – three dorsal fins.

(K. Shibukawa)

### *Butis butis* (Hamilton, 1822)

#### Duckbill Sleeper

D VI + I, 8; A I, 8; P<sub>1</sub> 18–19; LR 29–31; PDS 25–33. Body elongate, subcylindrical and compressed posteriorly. Head depressed. Snout elongate and depressed, duck-bill shaped. Lower jaw prominent. Bony edge with serrae on interorbital area around dorsal margin of eye. Pelvic fins widely separated. Cheek, operculum and interorbital with ctenoid scales; scales present between eye and interorbital bony ridge; small auxiliary scale between large body scales. **Color:** head and body blackish brown, with numerous black, orange and pale dots; base of pectoral fin with a distinct large black spot edged with two vivid red spots dorsoventrally. **Size:** 14.5 cm TL. **Distribution:** Indo-West Pacific. **Remarks:** found in brackish estuaries and mangrove swamps.

(K. Shibukawa)



*Butis butis*, KAUM-I. 33190, 8.6 cm SL  
Bang Pakong, 26 Nov. 2010



***Butis humeralis***  
(Valenciennes, 1837)

Flathead Gudgeon

D VI + I, 8; A I, 8; P<sub>1</sub> 18–20; LR 29–31; PDS 25. Body elongate, subcylindrical and compressed posteriorly. Head depressed; snout elongate and depressed, duck-bill shaped; bony interorbital serration around dorsal margin of eye; lower jaw protruding beyond upper jaw; teeth on outer row not enlarged. Pelvic fins widely separated. Cheek, operculum and interorbital with ctenoid scales; scales present between eye and interorbital bony ridge; small auxiliary scale between large body scales. **Color:** blackish brown, with indistinct mottles; base of pectoral fin with a distinct large black spot, edged with two vivid red spots dorso-ventrally. **Size:** 10.7 cm. **Distribution:** Indo-West Pacific. **Remarks:** found in brackish estuaries and adjacent coastal waters. (K. Shibukawa)



*Butis humeralis*, KAUM-I. 33213, 12.2 cm SL  
Bang Pakong, 26 Nov. 2010



*Butis koilomatodon*, KAUM-I. 24012, 6.1 cm SL  
Bang Saen, 1 Oct. 2009

***Butis koilomatodon***  
(Bleeker, 1849)

Mud Sleeper

D VI + I, 8; A I, 8; P<sub>1</sub> 21–22; LR 25–28; PDS 11–15. Body relatively short, subcylindrical and compressed posteriorly. Head slightly depressed. Lower jaw prominent. Bony edge with serrae on interorbital area around dorsal margin of eye. Pelvic fins widely separated. Cheek and operculum with ctenoid scales; no scales on interorbital area. **Color:** body blackish brown, with indistinct 4–5 broad dusky oblique bands; typically pectoral-fin base with a distinct black spot. **Size:** 7.5 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in mangrove swamps, brackish estuaries and adjacent coastal waters with muddy bottoms. (K. Shibukawa)



*Prionobutis microps*, KAUM-I. 33192, 14.5 cm SL  
Bang Pakong, 26 Nov. 2010

***Prionobutis microps***  
(Weber, 1907)

Small-eyed Loter

D VI + I, 8; A I, 8; P<sub>1</sub> 18–19; LR 21–22; PDS 35. Body elongate, subcylindrical and compressed posteriorly. Head depressed; snout relatively short, not duck-bill shaped; bony interorbital serration around dorsal margin of eye; lower jaw protruding be-

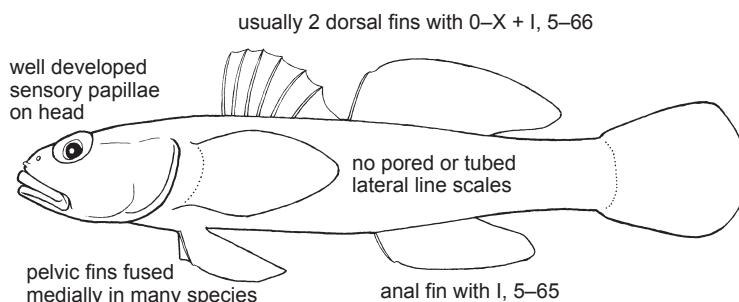
yond upper jaw; a row of barbel-like papillae on ventral surface of each side of lower jaw. Pelvic fins widely separated. Head totally scaled. **Color:** head and body blackish brown; fins dusky, usually with rows of blackish blotches. **Size:** 23 cm. **Distribution:** Papua New Guinea, northern Australia and Gulf of Thailand. **Remarks:** found in brackish estuaries.

(K. Shibukawa)

## GOBIIDAE

### Gobies

Small to moderate-sized (up to ca. 60 cm, commonly to 10 cm), bottomorientated fishes. Body shape highly variable, but, typically, moderately elongate and more or less compressed posteriorly; no pored or tubed lateral-line scales on body. Teeth typically conical (flattened and incisor-like in some genera), forming a single to several rows in each jaw; minute sensory papillae well developed on head (and few on body and caudal fin), forming transverse or longitudinal rows; five branchiostegal rays. Usually two dorsal fins, first one with 0–X flexible spines, second one usually with I spine and 5–66 soft rays; anal fin usually with I flexible spine and 5–65 soft rays; pectoral fin with 12–65 soft rays; dorsal- and anal-fin spines usually narrow and flexible; pelvic fins fused medially by frenum (between spines) and connecting membrane (between innermost rays), exclusive of several coral reef genera with separated ones; pelvic fin usually with I spine and 4–5 soft rays. Scales cycloid or ctenoid (with peripheral cteni only),



minute to moderately large in size. **Color:** highly variable.

**Remarks:** found in various habitats from torrential freshwater rivers to shelf waters (to depth of ca. 500 m), but most common in brackish waters and shallow coastal waters. Large species may be esteemed as food fish; several freshwater species may be treated as aquarium fish.

**Similar families occurring in the area:** Blenniidae – single dorsal fin (may be deep notch developed between spinous and soft portions); teeth incisor-like, forming single row in each jaw; pelvic fins separated.

Callionymidae – preopercle with a strong spine; no scales on body; gill opening restricted to a small dorsal or dorsolateral pore; pelvic fins separated. Eleotridae – pelvic fins separated; six branchiostegal rays. Platycephalidae – many short spines or bony tubercles on head; pelvic fins separated. Ptereleotridae – bottom-oriented, freeswimming fishes, with elongate (but not eel-like) and compressed body and separated pelvic fins; mouth almost vertical in many species. Tripterygiidae – three dorsal fins; pelvic fins separated.

(K. Shibukawa)

#### *Acentrogobius caninus* (Valenciennes, 1837)

##### Tropical Sand Goby

D VI + I, 9; A I, 9; P<sub>I</sub> 18; LR 26–27; PDS 16. Body moderately elongate and compressed. Head slightly compressed. Jaws subequal. Gill opening not extending anteriorly to a vertical through posterior margin of preopercle. Single or some enlarged caninoid teeth on each side of lower jaw. Tongue truncate. Pelvic fins united medially; frenum present. Scales ctenoid, excluding those on nape, pectoral base and breast cycloid; no scales on cheek; operculum may be scaled. Sensory canals and pores present on head; longitudinal pattern of sensory-



*Acentrogobius caninus*, KAUM-I. 32776, 8.0 cm SL  
Ang Sila, 23 Oct. 2010

papillae rows on cheek, some rows multiple. **Color:** large ovoid black spot just above dorsalmost of gill opening; four midlateral dusky spots on body. **Size:** 13 cm TL. **Distribu-**

**tion:** Indo-West Pacific. **Remarks:** found in brackish estuaries and adjacent coastal waters with sandy-mud bottom.

(K. Shibukawa)

*Acentrogobius viridipunctatus*  
(Valenciennes, 1837)

Spotted Green Goby

D VI + I, 10; A I, 9–10; P<sub>1</sub> 19–20; LR 33–35; PDS 27–33. Body moderately elongate and compressed. Head slightly compressed. Jaws subequal. Gill opening extending anteriorly to a vertical through posterior margin of preopercle. Single or some enlarged caninoid teeth on each side of lower jaw. Tongue truncate. Pelvic fins united medially; frenum present. Scales ctenoid, excluding those on head, nape, pectoral base and breast cycloid; upper part of cheek and operculum scaled. Sensory canals and pores present on head; distinct transverse sensory-papillae rows on cheek. **Color:** head and body grayish brown, with numerous bright light green or blue spots (faded immediately after death); L-shaped dusky marking below eye. **Size:** 12 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in brackish estuaries and adjacent coastal waters with sandy-mud bottoms.

(K. Shibukawa)



*Acentrogobius viridipunctatus*, KAUM-I. 33103, 7.1 cm SL  
Prachuap Khiri Khan, 13 Nov. 2010



*Arcygobius baliurus*, KAUM-I. 33119, 6.8 cm SL  
Gulf of Thailand (SS), 18 Nov. 2010

*Arcygobius baliurus*  
(Valenciennes, 1837)

Isthmus Goby

D VI + I, 9–10; A I, 8–9; P<sub>1</sub> 15–19; LR 22–27; PDS 8–11. Body moderately elongate and compressed. Head subcylindrical or somewhat compressed; lower jaw slightly projecting beyond upper jaw; gill opening broad, extending anteriorly to below eye. Pelvic fins fused medially; frenum present. Scales on body ctenoid; predorsal area, cheek and dorsal part of operculum with large cycloid scales. Sensory canals and pores present on head; numerous transverse rows of sensory papillae on cheek. **Color:** head and body beige or grayish brown dorsally, paler ventrally, with indistinct dusky mottles; a conspicuous black spot, as large as pupil, at caudal-fin base. **Size:** 10.2 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in brackish estuaries and adjacent bays with muddy bottoms. Isthmogobius, previously used as the generic name for this species, is not available (Larson & Wright, 2003).

(K. Shibukawa)



*Aulopareia unicolor*, KAUM-I. 32920, 5.6 cm SL  
Bang Pakong, 30 Oct. 2010

*Aulopareia unicolor*  
(Valenciennes, 1837)

Greenspot Goby

D VI + I, 10; A I, 9; P<sub>1</sub> 18–19; LR 30–32; PDS 23–25. Body moderately elongate and compressed. Head subcylindrical; lower jaw projecting beyond upper jaw. No elongate and filamentous dorsal-fin spines; pelvic fins united medially; frenum present. Scales ctenoid, excluding those on

nape, pectoral base and breast cycloid; head naked, except for occipital area and upper part of operculum with cycloid scales. Sensory canals and pores present on head; longitudinal pattern of sensory-papillae rows on cheek. **Color:** body dark grayish brown with many bright pale-green spots; a small black spot at upper part of caudal-fin base. **Size:** 11 cm. **Distribution:** Western Pacific. **Remarks:** found in brackish estuaries. (K. Shibukawa)



***Boleophthalmus boddarti***  
(Pallas, 1770)

Boddart's Goggle-eyed Goby

D V + 24–26; A 24–26; P<sub>1</sub> 17–21; LR 61–79; PDS 25–35. Body elongate, compressed. Head subcylindrical; snout rounded; gape near horizontal; jaws extending well beyond a vertical through posterior margin of eye; gill opening not extending anteriorly to a vertical line through posterior margin of preopercle; tongue adnate to floor of buccal cavity; uniserial row of teeth on each jaws, in addition to a single enlarged canine-like teeth internal to anterior margin of lower jaw. Pelvic fins united medially; frenum present. Cycloid scales on head and body; snout and chin naked. Sensory canals and pores present on head; reduced longitudinal pattern of sensory papillae rows on cheek. **Color:** head and body beige or brownish gray, slightly paler ventrally; a series of 6–7 oblique dusky bars on dorsal half of body; numerous bright sky blue dots scattered on head, body and dorsal fins. **Size:** 13.5 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found on exposed mudflats in protected bays and estuaries. (K. Shibukawa)

***Drombus triangularis***  
(Weber, 1909)

Brown Drombus

D VI + I, 9–10; A I, 8; P<sub>1</sub> 16–17; LR 30–31; PDS 12–19. Body moderately elongate and compressed. Head slightly depressed. Lower jaw projecting beyond upper jaw. Gill opening not reaching anteriorly to a vertical through preopercular margin. Pelvic fins united medially; frenum present. Scales ctenoid, excluding nape, breast, pectoral-fin base and predorsal area with cycloid scales; head naked. Sensory canals and pores present on head; distinct transverse pattern of sensory-papillae rows on cheek. **Color:** head and body dusky with irregular mottles; yellow triangular spot at uppermost of pectoral base. **Size:** 5 cm. **Distribution:** Indo-West Pacific. **Remarks:** found in mangrove swamps and brackish estuaries with rubbles. (K. Shibukawa)



*Boleophthalmus boddarti*, KAUM-I. 33186, 9.9 cm SL  
Bang Pakong, 26 Nov. 2010



*Drombus triangularis*, KAUM-I. 24014, 4.4 cm SL  
Bang Sean, 1 Oct. 2009



*Glossogobius aureus*, KAUM-I. 47485, 16.7 cm SL  
Bang Pakong, 23 June 2012

***Glossogobius aureus***  
Akihito & Meguro, 1975

Golden Flat-head Goby

D VI + I, 9; A I, 8–9; P<sub>1</sub> 18–21; LR 31–34; PDS 22–27. Body elongate and compressed. Head slightly depressed. Lower jaw prominent. Gill opening reaching anteriorly to, or a little beyond, a vertical through posterior margin of preopercle. Anterior margin of tongue notched. Pelvic fins united medially; frenum present. Scales ctenoid, excluding predorsal area, breast, belly and pectoral-fin

base and operculum with cycloid scales. Sensory canals and pores present on head; longitudinal pattern of sensory papillae on cheek. **Color:** head and body light yellowish brown, darkened dorsally; body with midlateral series of five dusky blotches, as well as many faint irregular dusky lines and spots dorsally. **Size:** 20 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in lower reaches of large rivers, mangroves, brackish estuaries and adjacent shallow coastal waters with sandy-mud bottoms. (K. Shibukawa)

(K. Shibukawa)

***Myersina crocatus***  
(Wongratana, 1975)

Yellow-markings Shrimpgoby

D VI + I, 10; A I, 9; P<sub>1</sub> 16–18; LR 65–78; PDS 0. Body moderately elongate and compressed. Head compressed; lower jaw projecting beyond upper jaw; gill opening extending anteriorly beyond a vertical through preopercular margin. Spines of first dorsal fin variably elongate, third and fourth spine longest; pelvic fins united medially; frenum present. No scales on head; body scales cycloid. Sensory canals and pores present on head; transverse pattern of sensory-papillae rows on cheek. **Color:** head and body pale gray or beige, darkened dorsally, sometimes with a horizontal dusky stripes from eye to caudal peduncle; many yellow spots scattered on head and pectoral-fin base; male with horizontal orange lines on body, whereas female has many narrow oblique or vertical whitish bars on body. **Size:** 8.5 cm SL. **Distribution:** Andaman Sea and West Pacific. **Remarks:** found on muddy bottoms; symbiotically associated with alpheid shrimps. (K. Shibukawa)



*Myersina crocatus*, KAUM-I. 23825, 7.2 cm SL  
Gulf of Thailand (SS), 25 Sept. 2009

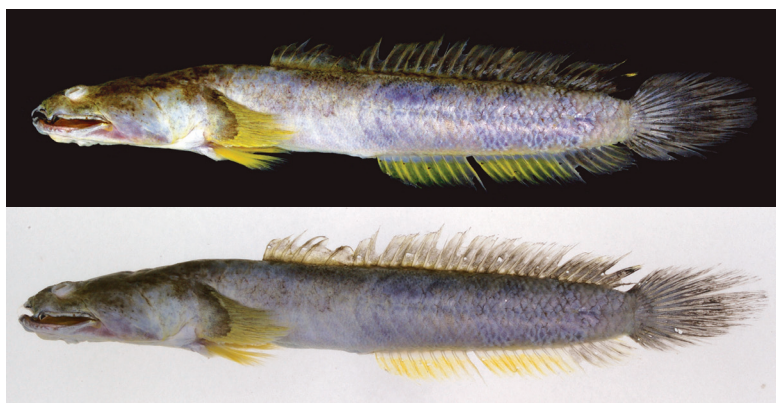


*Myersina filifer*, KAUM-I. 23194, 10.4 cm SL  
Gulf of Thailand (SS), 8 Sept. 2009

***Myersina filifer***  
(Valenciennes, 1837)

Filamentous Shrimpgoby

D VI + I, 10; A I, 9; P<sub>1</sub> 17–19; LR 79–101; PDS 0. Body moderately elongate and compressed. Head compressed; lower jaw projecting beyond upper jaw; gill opening extending anteriorly beyond a vertical through preopercular margin. Spines of first dorsal fin elongate, middle spines longest; pelvic fins united medially; frenum present. No scales on head; body scales cycloid. Sensory canals and pores present on head; transverse pattern of sensory-papillae rows on cheek. **Color:** head and body pale gray or beige, darkened dorsally; many small pale-blue spots on cheek and operculum; 6 dusky saddle-like blotches on body; a conspicuous black spot at anterior part of first dorsal fin. **Size:** 10 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in protected bays with sandy-mud bottoms; symbiotically associated with alpheid shrimps. Generic assignment follows Winterbottom (2002). (K. Shibukawa)



*Oxudercus dentatus*, KAUM-I. 23369, 7.5 cm SL  
Bang Pakong, 22 Sept. 2009

***Oxudercus dentatus***  
Eydoux & Souleyet, 1850

Brown Drombus

D VI + 24–27; A 24–27; P<sub>1</sub> 20–24; LR 59–66; PDS 0–22. Body elongate and compressed. Head depressed. Eyes small, dorsal on head. Jaws nearly horizontal, large, extending well beyond a vertical through posterior margin of eye. A single slender fang-like tooth around anterior tip of each side of upper jaw. Dorsal fins continuous; dorsal and anal fins not connected

to caudal fin. Caudal fin rounded or nearly lanceolate, slightly shorter than head. Pelvic fins fused medially, frenum present. Scales on head and body cycloid. **Color:** head and body beige, grayish brown, tinged with blue posteriorly; fins transparent or grayish, often tinged with yellow; a small black spot at distal part of posterior-most of dorsal fin. **Size:** 9.3 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in intertidal mudflats.

(K. Shibukawa)

***Parachaeturichthys polynema*  
(Bleeker, 1853)**

Taileyed Goby

D VI + I, 9–10; A I, 9; P<sub>1</sub> 20–21; LR 28–30; PDS 12–13. Body moderately elongate and compressed. Head subcylindrical; jaws subequal; numerous short barbels on ventral surface of head. No elongate and filamentous dorsal-fin spines; pelvic fins united medially; frenum present. Scales ctenoid, excluding those on head, nape, pectoral base and breast cycloid; cheek and operculum totally scaled. Sensory canals and pores present on head; longitudinal pattern of sensory-papillae rows on cheek. **Color:** body beige, darkened dorsally; a conspicuous large ocellus (as large as eye) at upper part of caudal fin. **Size:** 12 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in bays with sandy-mud bottoms. (K. Shibukawa)

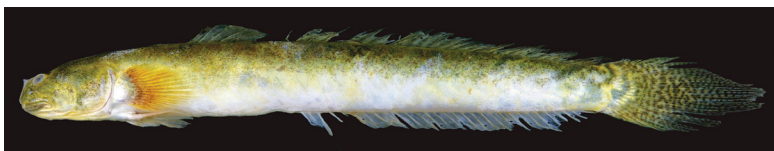


*Parachaeturichthys polynema*, KAUM-I. 33120, 6.6 cm SL  
Gulf of Thailand (SS), 18 Nov. 2010

***Pseudapocryptes elongatus*  
(Cuvier, 1816)**

Elongate Mudskipper

D V + 29–33; A 28–31; P<sub>1</sub> 17–21; LR 150–275; PDS 56–113. Body elongate and compressed. Head subcylindrical. Eyes small, dorsal on head. Jaws nearly horizontal, small, not reaching to a vertical through posterior margin of eye. Dorsal fins continuous; dorsal and anal fins not connected to caudal fin. Caudal fin lanceolate, subequal to, or slightly longer than, head. Pelvic fins fused medially, frenum present. Scales on head and body minute cycloid. **Color:** head and body grayish brown or beige dorsally, pale ventrally; 6–7 diagonal, short saddle-like dusky bars on dorsum; caudal fin with numerous blackish dots. **Size:** 18.7 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in brackish estuaries and adjacent intertidal mudflats. (K. Shibukawa)



*Pseudapocryptes elongatus*, KAUM-I. 47361, 14.8 cm SL  
Ang Sila, 8 June 2012



*Scartelaos histophorus*, KAUM-I. 47357, 9.5 cm SL  
Bang Pakong, 8 June 2012

***Scartelaos histophorus*  
(Valenciennes, 1837)**

Bearded Mudskipper

D V + 25–27; A 24–27; P<sub>1</sub> 19–21. Body elongate, compressed. Head slightly subcylindrical; dermal cup-like process developed beneath eye; each side of ventral surface of head with a row of barbels; an unpaired bar-

bel at ventral surface of lower jaw near symphysis; single row of conical teeth on each jaw, in addition to a pair of enlarged caninlike teeth internal to lower jaw symphysis; tongue entirely adnate to floor of buccal cavity. First dorsal fin elongate and falcate; pelvic fins fused medially; frenum present. Scales on body small cycloid, partially embedded. Sensory canals and pores

on head. **Color:** head and body grayish, with several narrow, vague dusky vertical bars especially on middle of body; caudal fin with 3–5 vertical rows of dusky spots. **Size:** 10.5 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found on intertidal mudflats in estuaries and bays.

(K. Shibukawa)



***Taenioides gracilis*  
(Valenciennes, 1837)**

Bearded Eel Goby

D VI, 42–52; A41–51; P<sub>1</sub> 12–18; LR 0; PDS 0. Body greatly elongate, eel-like. Head subcylindrical. Head, body and vertical fins enveloped by thick, rubbery dermal covering. No scales on head and body. Distinct cutaneous ridges on head. Typically a single median and three pairs of short, fleshy barbels on ventral surface of lower jaw. Eye reduced, minute. Teeth on outermost row of jaws enlarged, slender fang-like. Dorsal and anal fins confluent with caudal fin. Pelvic fins fused medially. Sensory canals and pores absent on head. **Color:** head and body grayish pink; vertical fins dull yellowish orange, dusky basally. **Size:** 31 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in brackish estuaries and adjacent coastal waters with muddy bottoms. (K. Shibukawa)



*Taenioides gracilis*, KAUM-I. 47358, 9.2 cm SL  
Bang Pakong, 8 June 2012



*Trypauchen vagina*, KAUM-I. 33095, 16.9 cm SL  
Prachuap Khiri Khan, 13 Nov. 2010

***Trypauchen vagina*  
(Bloch & Schneider, 1801)**

Pink Worm Goby

D VI, 40–50; A39–47; P<sub>1</sub> 15–20; LR 80–115; PDS 0. Body very elongate and compressed. Head compressed. A pouch-like cavity just above operculum. Eye reduced, difficult to be discerned from external view. Dorsal and anal fins confluent with caudal fin. Pelvic fins fused medially, but connecting membrane between innermost rays emarginated posteriorly; frenum low. Scales on body cycloid; head naked. Sensory canals and pores absent on head; numerous sensory papillae scattered on cheek. **Color:** head and body entirely reddish. **Size:** 15 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in bays and brackish estuaries with muddy bottom.

(K. Shibukawa)



*Yongeichthys nebulosus*, KAUM-I. 33161, 9.8 cm SL  
Gulf of Thailand (SS), 25 Nov. 2010

***Yongeichthys nebulosus*  
(Forsskål, 1775)**

Shadow Goby

D VI + I, 9; A I, 9; P<sub>1</sub> 17–18; LR 25–28; PDS 0. Body moderately elongate, compressed. Head slightly compressed; jaws subequal; gill opening not extending anteriorly to a vertical through preopercular margin. Pelvic fins united medially; frenum present. Scales ctenoid, excepting those on breast and pectoral-fin base cycloid;

head naked. Sensory canals and pores present on head; longitudinal pattern of sensory-papillae rows on cheek, some rows multiple; aggregation of sensory papillae just behind chin. **Color:** body pale gray or pale brown, with two dusky saddles and three large dusky midlateral spots. **Size:** 10 cm SL. **Distribution:** Indo-West Pacific. **Remarks:** found in brackish estuaries and adjacent coastal waters with sandy-mud bottoms. (K. Shibukawa)

## EPHIPPIDAE

### Spadefishes (Batfishes)

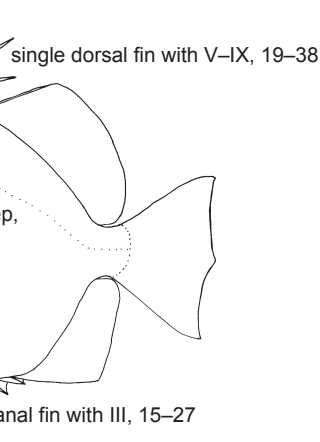
Medium sized (up to 20 cm) marine fishes. Body deep, orbicular and strongly compressed. Head short, its length shorter than half of body depth; interorbital region and anterior part of head naked or head covered with scales. Mouth small, rear end of upper jaw not reaching vertical through anterior edge of eye; upper jaw not protrusible; jaws covered with bands of slender setiform or compressed teeth. Dorsal fin single or deeply notched before soft-rayed part, with V–IX spines and 19–38 soft rays; anal fin with III spines and 15–27 soft rays; pectoral fins rounded and usually shorter than head; caudal fin truncate or wedge shaped. Scales large and smooth, or small and ctenoid. Lateral line complete.

**Color:** adults silvery, silvery blue-green, or yellowish silvery; frequently with vertical dark bars.

**Remarks:** occurring in various shallow water habitats including estuaries, harbors, and coral reefs. Mar-

keted fresh but with small commercial importance.

**Similar families occurring in the area:** Drepanidae – upper jaw greatly protrusible; pectoral fins elongate reaching posterior part of anal fin base. Chaetodontidae – dorsal fin with VI–XVII spines and 14–34 soft rays; anal fin with III–V spines and 15–24 soft



rays. Monodactylidae – pelvic fins rudimentary or absent. Scatophagidae – dorsal fin notched or divided to base before soft rayed part, with XI or XII spines and 15–18 soft rays; anal fin with IV spines and 13–17 soft rays.

(K. Matsuura)

### *Ephippus orbis* (Bloch, 1787)

#### Spadefish

D IX, 19–20; A III, 15–17; P<sub>1</sub> 18–19; LL 39–43. Body orbicular, strongly compressed, head length less than half of body depth. Mouth small, upper jaw not reaching posteriorly vertical through anterior edge of eye; upper jaw not protrusible; jaws covered with bands of slender incisiform teeth. Preopercle distinctly serrate with a wide naked margin. Single dorsal fin with a deep notch before soft rayed part; pectoral fins shorter than head. Scales relatively large and smooth. Lateral line complete. **Color:** head and body silvery blue-green; 4 to 5 vertical dark bars frequently on body; fins dusky. **Size:** maximum size 20 cm. **Distribution:** tropical regions of the Indo-West Pacific from India to Indonesia, north to southern Japan. (K. Matsuura)



*Ephippus orbis*, KAUM-I. 33107, 10.0 cm SL  
Gulf of Thailand (SS), 18 Nov. 2010

*Platax teira*  
(Forsskål, 1775)

Spotbelly Batfish

D V–VI, 29–34; A III, 21–26; P<sub>1</sub> 16–28; LL 56–66; GR 9+11. Body orbicular, strongly compressed. Snout short, contour of frontal almost vertical in large adults. Five pores on each side of lower jaw. Tricuspid teeth on jaws; middle cusp slightly larger than lateral cusps; a few teeth on vomer but palatines toothless. **Color:** body yellowish silver with 3 vertical black bands; pelvic fin yellow; a black blotch laterally on belly. **Size:** maximum length 70 cm. **Distribution:** Indo-West Pacific. **Remarks:** occurring in inshore waters. (S. Kimura)



*Platax teira*, KAUM–I. 23947, 13.2 cm SL  
Bang Pakong, 30 Sept. 2009



## SCATOPHAGIDAE

### Scats

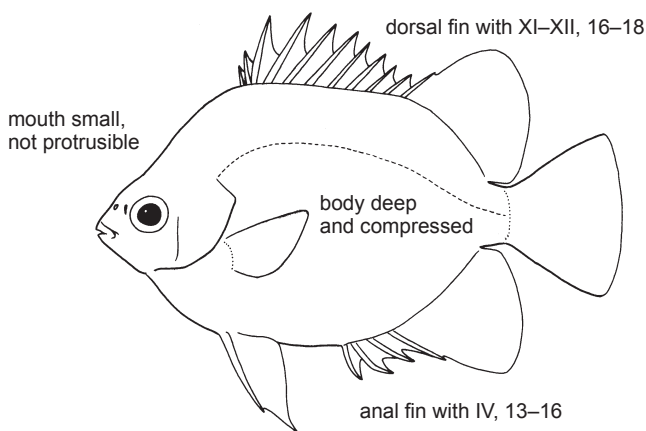
Body greatly compressed, reaching to 32 cm. Dorsal profile of head steeply ascending to dorsal fin origin; snout rounded. Mouth small, terminal; jaws not protrusible; villiform teeth in several rows on jaws. Eye relatively large, its diameter slightly shorter than snout length. Dorsal fin with XI or XII spines and 16–18 soft rays; first dorsal fin spine procumbent; a deep notch between spinous and soft portions of dorsal fin. Anal fin with IV spines and 13–16 soft rays. Pectoral fin with 16 or 17 soft rays. Caudal fin rounded in juveniles, truncate or slightly emarginated in adults. Head and body covered with small cycloid scales. **Color:** head and body greenish or silvery with many black spots or bars.

**Remarks:** occurring in estuaries, harbors, and lower reaches of rivers. Marketed fresh but with small com-

mercial importance.

**Similar families occurring in the area:** Chaetodontidae – lacking a deep notch between spinous and soft parts of dorsal fin; jaws protrusible. Drepanidae – anal fin with III spines;

jaws protrusible; pectoral fins elongate, reaching beyond anal fin origin. Pomacanthidae – preopercle with a strong, backwardly pointed spine; no deep notch between spinous and soft parts of dorsal fin. (K. Matsuura)



### *Scatophagus argus* (Bloch, 1788)

#### Spotted Scat

D XI, 16–18; A IV, 14–15; P<sub>1</sub> 16. Body quadrangular, strongly compressed. Dorsal profile of head steeply ascending to dorsal fin origin; snout rounded. Mouth small, terminal; jaws protrusible; villiform teeth in several rows on jaws. Teeth villiform, making several rows on jaws. Eye relatively large, its diameter slightly shorter than snout length. **Color:** ground color of head and body greenish; juveniles with a few large round blotches being almost equal to eye in size, or with 5–6 wide dark, vertical bars; adults with less distinct dark blotches or markings. **Size:** maximum size 35 cm. **Distribution:** tropical regions of Indo-West Pacific from southern India and Sri Lanka eastward to Tahiti, and northward to southern Japan. (K. Matsuura)



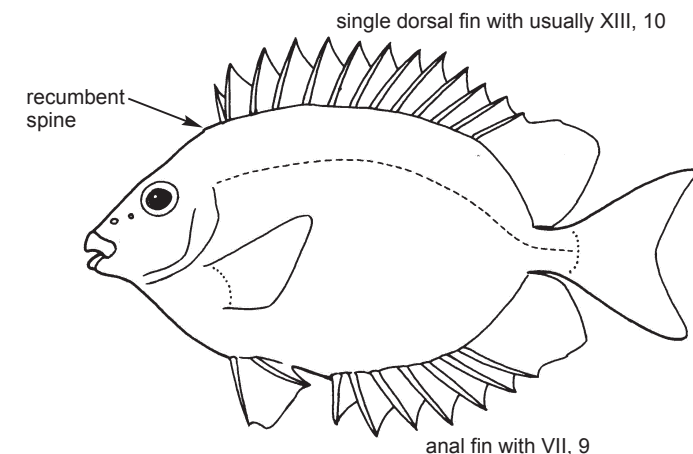
*Scatophagus argus*, KAUM-I. 32674, 8.4 cm SL  
Gulf of Thailand (SS), 22 Oct. 2010

## SIGANIDAE

### Rabbitfishes

Body oval, strongly compressed, reaching to 55 cm. Mouth small, terminal; jaws not protrusible; a single row of compressed, incisiform teeth on jaws. Dorsal fin with XIII spines and 10 soft rays, preceded by embedded, recumbent spine. Anal fin with VII spines and 9 soft rays. Pelvic fins with an inner and outer spines and separated 3 soft rays. Fin spines with a pair of grooves containing venom glands. Body covered with small, cycloid scales. **Color:** species inhabiting coral reefs having bright color with reticulations and markings, and other species with drab mottled pattern.

**Remarks:** dwelling on bottom in shallow coastal waters. Some species found in coral reefs and others in mangroves and seagrass beds. Pri-



marily herbivorous. Caught by bottom trawlers, traps, set nets and by spear. Marketed fresh.

**Similar families occurring in the**

**area:** Acanthuridae and Chaetodontidae—I spine and 5 soft rays in pelvic fins. (K. Matsuura)

#### *Siganus canaliculatus* (Park, 1797)

##### Whitespotted Spinefoot

D XIII, 10; A VII, 9; P<sub>1</sub> 16–17; P<sub>2</sub> I, 3, I. Body oblong, compressed, relatively slender, its depth 2.3–2.8 in SL. Last anal-fin spine 1.2–1.5 in longest anal-fin spine; soft parts of dorsal and anal fins low, longest dorsal-fin ray 0.7–1.0 in longest dorsal-fin spine; caudal fin almost emarginate in specimens < 10 cm SL, forked in larger fish. **Color:** highly variable, but body ground color dark olive green or brownish gray dorsally, silvery white ventrally; numerous pearly blue to whitish spots on nape and body. **Size:** maximum size about 25 cm, commonly to 20 cm. **Distribution:** Persian Gulf to Indonesia, northern Australia, Vietnam, Thailand, and Malaysia. **Remarks:** inhabits shallow coastal waters. Feeds mainly on seaweeds. (S. Kimura)



*Siganus canaliculatus*, KAUM–I. 32833, 13.4 cm SL  
Gulf of Thailand (SP), 25 Oct. 2010

***Siganus fuscescens***  
(Houttuyn, 1782)

Mottled Spinefoot

D XIII, 10; A VII, 9; P<sub>1</sub> 15–17. Body oval, relatively slender, its depth 2.3–2.9 in SL. Last anal-fin spine 1.3–1.5 in longest anal-fin spine. Soft parts of dorsal and anal fins low, longest dorsal fin ray 0.5–1 times in longest dorsal fin spine. Caudal fin slightly concave in individuals smaller than 10 cm SL, and becoming more concave with growth. **Color:** greatly variable, but body ground color olive green or light brown on sides and back, silvery on ventral half; many small light blue spots scattered on head and body. **Size:** maximum size 40 cm, commonly to 25 cm. **Distribution:** western coast of Malay Peninsula and West Pacific from Thailand eastward to New Caledonia, northward to the Ryukyu Islands, and southward to northern Australia. (K. Matsuura)

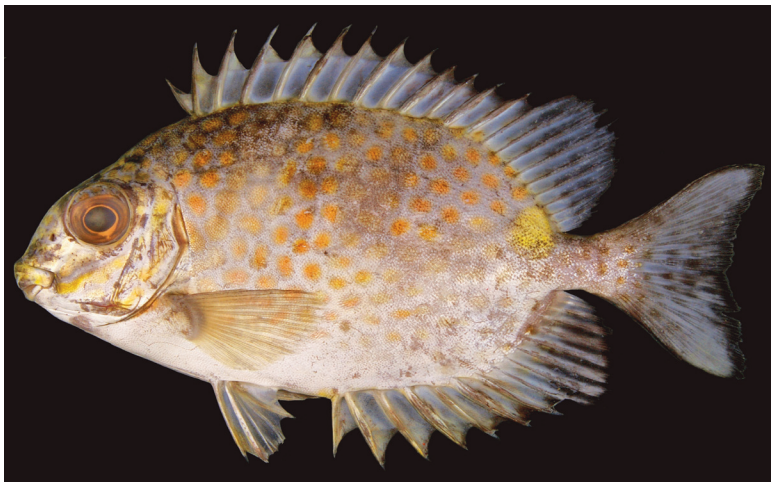


*Siganus fuscescens*, KAUM-I. 33093, 15.3 cm SL  
Prachuap Khiri Khan, 13 Nov. 2010

***Siganus guttatus***  
(Bloch, 1787)

Orangespotted Spinefoot

D XIII, 10; A VII, 9; P<sub>1</sub> 15–17. Body oval, strongly compressed, its depth 1.8–2.3 in SL. Snout short, dorsal profile of head steep anteriorly, somewhat concave above eye. Fifth to eighth dorsal-fin spine longest. Last anal-fin spine longest, longer than longest dorsal-fin spine. Caudal fin emarginate but moderately forked in large adults. Scales minute. **Color:** many large to medium-sized orange to bronze spots scattered laterally on body with a bright yellow spot at base of last few dorsal-fin rays. **Size:** maximum length about 40 cm, commonly to 25 cm. **Distribution:** Andaman Sea and western Pacific. **Remarks:** inhabits shallow coastal waters, often in brackish waters especially sea grass and mangrove areas. Marketed fresh. (S. Kimura)



*Siganus guttatus*, KAUM-I. 32873, 11.2 cm SL  
Gulf of Thailand (SS), 27 Oct. 2010



***Siganus javus***  
(Linnaeus, 1766)

Streaked Spinefoot

D XIII, 10; A VII, 9; P<sub>1</sub> 15–17. Body relatively deep, its depth 2.0–2.3 in SL. Last dorsal fin spine 1.2–1.6 in fourth to sixth spine. Except for short first spine, all anal-fin spines similar in length. Soft parts of dorsal and anal fins moderately high, longest anal-fin ray subequal to longest anal-fin spine. Caudal fin slightly concave. **Color:** dark bronze on dorsal half, becoming paler ventrally; many gun-metal blue spots on head and dorsal half of body; silvery blue undulating lines on ventral half of body. **Size:** maximum size 50 cm, commonly to 30 cm. **Distribution:** Indo-West Pacific from the Persian Gulf through the Malay Peninsula eastward to Vanuatu, northward to the Philippines, and southward to northern Australia. (K. Matsuura)



*Siganus javus*, KAUM-I. 32965, 16.5 cm SL  
off Chantha Buri (SP), 1 Nov. 2010

***Siganus virgatus***  
(Valenciennes, 1835)

Doublebarred Spinefoot

D XIII, 10; A VII, 9; P<sub>1</sub> 16–17. Body oval, strongly compressed, its depth 1.8–2.3 in SL. Snout moderate, dorsal profile of head convex. Fifth to seventh dorsal-fin spine longest. Third or fourth anal-fin spine usually longest. Caudal fin emarginate. **Color:** a dark brown band running from nape through eye to chin; another from fourth to fifth dorsal-fin spine bases to pectoral fin base; these dark bands containing light blue small spots and short lines; posterior to second band, orange to yellow dorsally with light blue spots, silver white ventrally. **Size:** maximum length about 33 cm, commonly 20 cm. **Distribution:** eastern Indian Ocean and western Pacific, from southern India to northern Australia, north to southern Japan. **Remarks:** inhabits shallow coastal waters, around coral reefs. Juveniles often enter mangrove areas.

(S. Kimura)



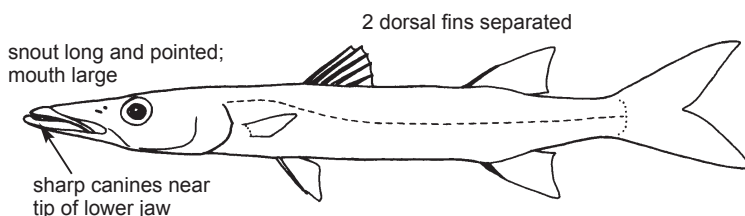
*Siganus virgatus*, KAUM-I. 32871, 12.6 cm SL  
Gulf of Thailand (SS), 27 Oct. 2010

## SPHYRAENIDAE

### Barracudas

Body elongate, slightly compressed, reaching to 170 cm. Head long; snout pointed. Mouth horizontal, large; lower jaw projecting; large, sharp flattened or conical teeth on jaws; usually 1 or 2 canine teeth on tip of lower jaw. Gill rakers, if present, as short spinules, 1 or 2 at angle of gill arch. Two short dorsal fins, widely separated; the first with IV spines located above or slightly behind pelvic fins; the second with I spine and 9 soft rays. Anal fin with II spines and 7–9 soft rays. Caudal fin deeply forked. **Color:** gray to blue, or light brown dorsally, with silvery reflections, paler or white ventrally.

**Remarks:** carnivorous pike-like, pelagic to demersal fishes in tropical



and temperate seas. Most of members of the Sphyraenidae found in coastal areas but also in the surface of open seas or down to depths of 100 m. Caught by handlines, gill nets, set nets or trawls. Marketed fresh, also dried-salted.

**Similar families occurring in the area:** Atherinidae and Mugilidae – having 2 separate dorsal fins and silver body, but having a short snout and small mouth without canine teeth.

(K. Matsuura)

#### *Sphyraena jello*

Cuvier, 1829

Pickhandle Barracuda

D V + I, 9; A II, 7–9; P<sub>1</sub> 14–15; GR 0; LLp 130–140. Body elongate, subcylindrical. Snout long, pointed; posterior tip of maxilla reaching just below anterior margin of eye. First gill arch with rough platelets but lacking distinct spine. Last ray of second dorsal fin not elongate in comparison with penultimate ray; caudal fin typically forked in all stages, without a pair of lobes at posterior margin; pelvic-fin insertion anterior to first dorsal-fin origin. **Color:** body brownish dorsally, silvery white ventrally, with many dark bars crossing lateral line, each bar oblique in upper half, but almost vertical in lower half. Caudal fin yellow without white tips. **Size:** maximum length 125 cm, commonly to 80 cm. **Distribution:** widely distributed in Indo-West Pacific, from East Africa and Red Sea to New Caledonia and Vanuatu. **Remarks:** inhabits coastal waters, estuaries, and inner lagoon.

(S. Kimura)



*Sphyraena jello*, KAUM-I. 47413, 18.3 cm SL  
Ang Sila, 15 June 2012



*Sphyraena obtusata*, KAUM-I. 47757, 15.1 cm SL  
Prachuap Khiri Khan, 21 July 2012

#### *Sphyraena obtusata*

Cuvier, 1829

Obtuse Barracuda

D V + I, 9–10 (usually 9); A II, 9; P<sub>1</sub>

11–13; P<sub>2</sub> I, 5; GR 2; LLp 78–85. Body elongate, subcylindrical. Snout long, pointed; posterior tip of maxilla just reaching to or extending beyond anterior nostril. Posterior tip of opercle rounded, obtuse above level of pectoral-fin base. Caudal peduncle low, moderately compressed. Pelvic-fin origin anterior to origin of first dorsal fin. Scales on body cycloid, highly deciduous; scales above lateral line 5–7.5; scales below lateral line 8.5–9.5. **Color:** head and body dark green dorsally, silvery-white ventrally.

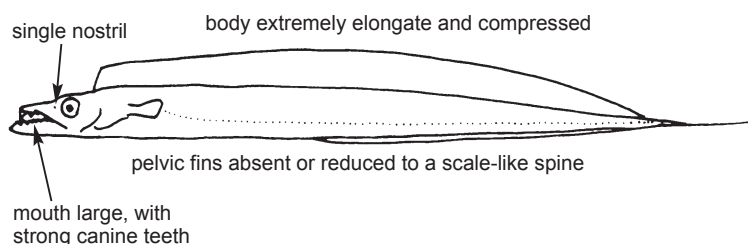
Two indistinct yellow to brown longitudinal stripes laterally on body. Caudal fin yellow with greenish base. **Size:** maximum length 55 cm. **Distribution:** widely distributed in Indo-West Pacific, from East Africa and Red Sea to Papua New Guinea, north to Japan. This species invaded to eastern Mediterranean. **Remarks:** inhabits shallow coastal waters. Marketed fresh, salted and dried. *Sphyraena flavicauda* Rüppell is a junior synonym of *S. obtusata* (see Doiuchi & Nakabo, 2005).

(S. Kimura)

## TRICHIURIDAE

### Cutlassfishes

Body remarkably elongate and compressed, ribbon-like, with a tapered tail or small forked caudal fin (up to over 2 m). A single nasal opening on each side of head. Mouth large, jaws not protractile, lower jaw extends anterior to upper jaw. Teeth extremely strong, fang-like in anterior part of upper jaw and sometimes in anterior part of lower jaw. Dorsal fin low and long, beginning shortly behind eye, its anterior spinous part shorter than posterior soft part, 2 parts continuous mostly or interrupted by a shallow notch sometimes. Anal fin low or reduced to short spinules. Caudal fin either small and forked or absent. Pectoral fins short and low in position. Pelvic fins reduced to a scale-like spine (plus a rudimentary ray in *Benthodesmus*) or completely absent (in *Trichiurus* and *Lepturacanthus*). Preanal length less than 1/2



standard length. Lateral line single. Scales absent.

**Color:** body generally metallic silvery or more or less brown in *Aphanopus* and *Lepidopus*; pectoral fin semi transparent; dorsal and anal fins sometimes tinged with pale yellow. Usually no distinct marks or blotches on body.

**Remarks:** benthopelagic on continental shelves and slopes and un-

derwater rises, from the surface to a depth of about 2 000 m, found in tropical to warm-temperate waters. Excellent eating, although the flesh is scanty. Marketed mostly fresh or salted, sometimes also frozen.

**Similar families occurring in the area:** Gempylidae – double nostrils on each side of head; 2 dorsal fins. (M. Matsunuma)



### *Trichiurus lepturus* Linnaeus, 1758

#### Largehead Hairtail

D III, 124–138; A II, 105–108; P<sub>1</sub> 10–12. Body extremely elongate and strongly compressed, ribbon-like, tapering to a point posteriorly. Eye large; mouth large, with a dermal process at tip of each jaw; 2 or 3 pairs of enlarged fangs with barbs near tip of upper jaw, and another pair near tip of lower jaw, a single series of sharp, compressed lateral teeth in both jaws, minute teeth on palatines. Lower hind

margin of gill cover concave. Dorsal fin high and long, without a notch between spinous and soft parts; pectoral fin rather short, but extend beyond lateral line; caudal and pelvic fins absent. No scales on body. **Color:** fresh specimens steel blue with silvery reflection, pectoral fins semi-transparent, other fins sometimes tinged with pale yellow hyaline in fresh, especially strong yellow just after death. **Size:** maxi-

mum length about 1.8 m. **Distribution:** considered as a cosmopolitan species of tropical and temperate waters. **Remarks:** basically offshore waters, and occurs in somewhat deeper coastal area, but often collected even in mangrove or estuary basin and to a depth of ca. 150 m depth.

(M. Matsunuma)

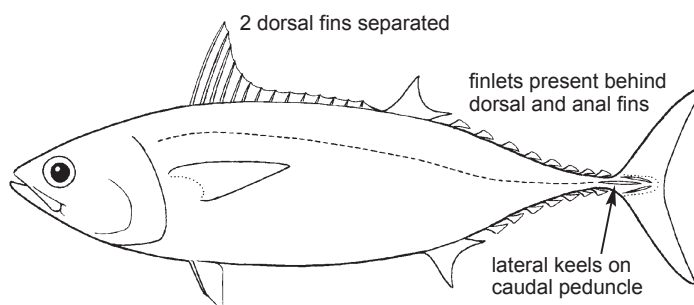
*Trichiurus lepturus*, KAUM-I. 33185, 31.2 cm SL  
Gulf of Thailand (SS), 25 Nov. 2010



## SCOMBRIDAE

### Mackerels and Tunas

Medium to large sized marine fishes, maximum size over 5 m. Body relatively elongate and fusiform, moderately compressed. Snout pointed, upper jaw not protrusible. Caudal peduncle slender with 2 or more lateral keels on each side. Two dorsal fins, the first usually short based with IX–XXVII spines, separated from or apparently contiguous to the second. Finlets (5–12 each) present behind second dorsal and anal fins. Caudal fin deeply forked. Pectoral fins inserted high on body. Pelvic fins relatively small with 1 spine and 5 soft rays, located below pectoral fins. Body covered with small to medium cycloid scales or a corselet developed on area behind head and pectoral fins. Lateral line present. **Color:** body dark blue or



dark green dorsally, silvery white ventrally. Usually dark vertical or longitudinal bands and/or spots on sides.

**Remarks:** typical pelagic fishes; smaller fishes usually inhabits inshore waters; large tunas, *Thunnus*, transoceanic migrants. Important food fishes.

**Similar families occurring in the area:** Carangidae – dorsal-fin spines

III–VIII; II detached anal-fin spines; scutes developed along posterior part of lateral line in most species. Gemmylidae – body dark brown to brown dorsally without distinct marks or blotches; no keels on caudal peduncle except *Lepidocybium*.

(S. Kimura)

### *Auxis thazard* (Lacepède, 1800)

#### Frigate Tuna

D XI–XII + 10–12; A 12–14; P<sub>1</sub> 22–25; GR 38–42. Body fusiform, somewhat deep, compressed. Jaws with small conical teeth. Caudal peduncle with a large lateral keel and caudal-fin base with 2 small keels. Two dorsal fins well separated by a wide interspace. Seven to 8 finlets both dorsally and ventrally on caudal peduncle. A large flap between pelvic fins (interpelvic process). Body naked except for corselet which becoming steeply narrower below interspace between dorsal fins. **Color:** head and body dark blue dorsally, silvery white ventrally. A blue-black spot on upper gill cover separated from blue-black area on dorsum of head. Dark blue vermiculate



*Auxis thazard*, KAUM–I. 47407, 24.2 cm SL  
Ang Sila, 15 June 2012

markings or stripes dorsolaterally on posterior body. **Size:** maximum length 65 cm FL. **Distribution:** Circumglobal in tropical and temperate seas, including Red Sea and Hawaiian Islands, but not the eastern Pacific.

**Remarks:** closely related species

*Auxis eurydorax* Collette & Aadland, 1996 distributed restrictedly in the eastern Pacific. The species was originally described as a subspecies of *A. thazard*.

(S. Kimura)

***Rastrelliger brachysoma***  
(Bleeker, 1851)

Short Mackerel

D VIII–XI + 12; A I, 12; P<sub>1</sub> 19–20; LGR 30–48. Body moderately deep, compressed. Head equal to or less than body depth. Maxilla covered by lacrimal bone. Adipose eyelid well developed. Gill rakers very long, visible when mouth is opened. Caudal fin base with 2 small lateral keels. Two dorsal fins widely separated. Anal fin spine rudimentary. Five dorsal and 5 anal finlets. Pectoral fins short; a small single flap between pelvic fins (interpelvic process). Body covered with small scales. **Color:** head and body bluish green dorsally, silverywhite ventrally. First dorsal and caudal fins yellowish. **Size:** maximum length 35 cm FL. **Distribution:** tropical waters of central Indo-West Pacific, from Andaman Sea to Fiji, north to Philippines. **Remarks:** found in neritic waters. Feeds on microzooplanktons and phytoplanktons. Marketed fresh, dried, salted, and smoked. (S. Kimura)



*Rastrelliger brachysoma*, KAUM–I. 33019, 12.6 cm SL  
Gulf of Thailand (SS), 3 Nov. 2010

***Rastrelliger kanagurta***  
(Cuvier, 1816)

Indian Mackerel

D VIII–XI + 11–13; A I, 11–12; P<sub>1</sub> 19–22; LGR 30–46. Body slightly deep, compressed. Head longer than body depth. Maxilla covered by lacrimal bone. Adipose eyelid well developed. Gill rakers very long, visible when mouth is opened. Caudal fin base with 2 small lateral keels. Two dorsal fins widely separated. Anal fin spine rudimentary. Five or six dorsal and anal finlets. Pectoral fins short; a small single flap between pelvic fins (interpelvic process). Body covered with small scales. **Color:** head and body bluish green dorsally, silvery-white ventrally. One or two rows of small, dark spots dorsolaterally on body. First dorsal, caudal and pectoral fins yellowish. **Size:** maximum length 35 cm, commonly to 25 cm FL. **Distribution:** widely distributed in Indo-West Pacific, from South Africa and Red Sea to Samoa, north to southern Japan. **Remarks:** found in coastal waters. Feeds on macrozooplanktons. Marketed fresh, dried, salted, and smoked. (S. Kimura)



*Rastrelliger kanagurta*, KAUM–I. 47708, 17.3 cm SL  
Rayong, 11 July 2012



*Scomberomorus commerson*, KAUM–I. 47470, 26.0 cm SL  
Gulf of Thailand (SS), 20 June 2012

***Scomberomorus commerson***  
(Lacepède, 1800)

Narrowbarred Spanish Mackerel

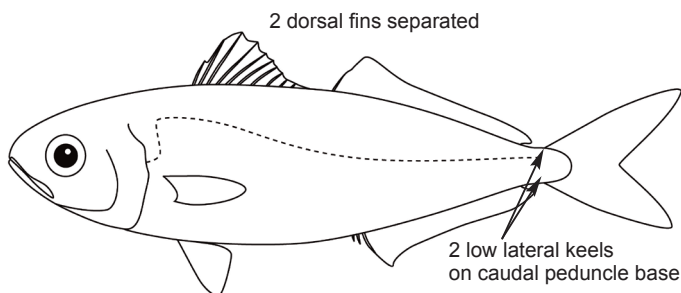
D XV–XVIII + 15–20; A 16–21; P<sub>1</sub> 21–24; GR 0–2 + 1–8 = 1–8, V 19–20 + 23–27 = 42–46. Body elongate, strongly compressed. Upper jaw reaching to or extending slightly beyond posterior margin of eye. Teeth on jaws strong with finely serrated edge. Caudal peduncle with a large lateral keel and caudal-fin base with 2 small keels. Two dorsal fins scarcely separated. Eight to 11 dorsal and 7–12 anal

finlets. Pectoral fins short, pointed. Body covered with small scales. A single lateral line abruptly bent downward below posterior end of dorsal-fin base. **Color:** head and body bluish silver dorsally, silvery-white ventrally. Many vertical dark bars on body. **Size:** maximum length 220 cm, commonly to 90 cm FL. **Distribution:** widely distributed in Indo-West Pacific, from South Africa and Red Sea to Fiji, north to Japan. **Remarks:** found in coastal waters. Feeds on fishes. Marketed mainly fresh. (S. Kimura)

## ARIOMMATIDAE

### Ariomatids

Small to medium-sized (to 78 cm) fishes. Body deep, compressed, or more rounded, elongate body; flesh firm and oily; skin thin, mucous canal system well-developed beneath skin. Caudal peduncle short and slender, not compressed; with 2 low lateral keels on each side near caudal-fin base. Head moderately large, compressed. Opercle very thin, delicate. Eye large. Mouth small and terminal, upper jaw not protractile, almost totally covered by lacrimal (preorbital) bone when mouth closed; teeth absent from palatines and vomer. Gill rakers slender and numerous, about 20 to 30 on first gill arch. Branchiostegal rays 6. Two distinct dorsal fins, almost connected; first dorsal fin with X to XIII; second dorsal fin much lower than first dorsal fin, usually with I spine and 13 to 16 soft rays. Anal fin with I to III and 13 to 18 soft rays, similar to second dorsal fin in shape but with shorter base. Caudal fin deeply forked. Pelvic-fin



origin below or behind pectoral-fin insertion. Lateral line on upper half of body. Scales large, cycloid, thin, very deciduous, top of snout naked to above eye, sharply demarcated from predorsal scales. Vertebrae 29 to 32.

**Color:** silvery, with opalescent tinges; slightly darker on back.

**Remarks:** Occur in large demersal schools on the continental shelf and slope to depths of at least 750 m. Appear to feed on small pelagic invertebrates.

**Similar families occurring in the**

**area:** Carangidae – a large mouth, I to II separate spines preceding anal fin, spinous dorsal fin lower than soft dorsal fin and many have scutes on caudal peduncle. Centrolophidae – a single dorsal fin; spinous much lower than soft dorsal fin; caudal keels absent; branchiostegal rays 7. Nomeidae – caudal peduncle deep and compressed; caudal keels absent; teeth present on palate. (S. Tafzilmeriam)

#### *Ariomma indicum* (Day, 1871)

##### Indian Ariomma

D X–XII + I, 14–15; A III, 14–15; P<sub>1</sub> 21–24; P<sub>2</sub> I, 5; GR 23; V 31. Body firm, moderately deep (more than 40% standard length), slightly compressed. Caudal peduncle slender, not compressed, almost square in cross-section with a very low keel (mostly indistinct) at base of each caudal-fin lobe. Snout blunt and rounded; mouth very small, terminal, upper jaw not protractile, almost totally covered by lacrimal (preorbital) bone when mouth closed. Eye moderately large. Jaw teeth small, cusps at tip minute. Two dorsal fins, almost joined at bases; first dorsal fin originating over or slightly before pectoral-fin base; spines long and slender, delicate, about twice length of longest soft rays. Anal fin similar in shape to second dorsal fin. Caudal fin deeply forked. Pelvic fins short. Scales small, cycloid and extremely deciduous. Lateral line located on upper side, following dor-



*Ariomma indicum*, KAUM-I. 32825, 12.9 cm SL  
Gulf of Thailand (SP), 25 Oct. 2010

sal profile but not extending onto caudal peduncle. **Color:** silvery but slightly more brownish dorsally; young with darker patches and blotches on side, fading or absent in adults; first dorsal fin and margin of caudal fin dark; dark vertical band through mid-eye. **Size:** maximum standard length about 25 cm, commonly to 18

cm. **Distribution:** Eastern Africa, along the continental margin of the northern Indian Ocean, eastward to Japan and the Gulf of Carpentaria, Australia. **Remarks:** mainly demersal in small schools on the continental shelf in depths below 50 m but occasionally caught on the upper continental slope to 300 m. (S. Tafzilmeriam)

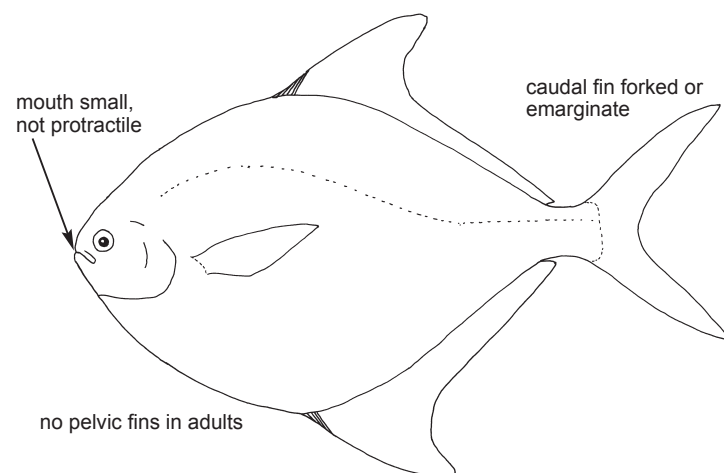


## STROMATEIDAE

### Butterfishes

Medium sized (up to 60 cm) marine fishes. Body strongly deep and compressed. Snout short, blunt. Mouth small, terminal or slightly inferior, not protractile. Teeth on jaws uniserial, small and flattened with 3 minute cusps. No teeth on vomer or palatines. Gill membranes joined to breast (*Pampus*) or not usually connected to isthmus (*Peprilus* and *Stromateus*). Branchiostegal rays 5 or 6. Caudal peduncle short and compressed with no scutes or keels. Dorsal fin single, anal fin similar in shape to dorsal fin. Caudal fin forked or emarginate. Pectoral fins long. Pelvic fins absent in adults. Body covered with small cycloid scales. Lateral line single dorsolaterally on body. **Color:** body silvery white, dark brownish in some species.

**Remarks:** coastal fishes, feeds mainly on zooplanktons. Three genera, *Pampus* (Indo-West Pacific), *Peprilus* (western Atlantic and eastern Pacific), and *Stromateus* (Atlantic and eastern Pacific). Important



food fishes.

**Similar families occurring in the area:** Carangidae – *Parastromateus niger*, very similar in shape to *Pampus*, having small scutes along posterior

part of lateral line; gill membrane not united to isthmus. Centrophidae – pelvic fins present; 7 branchiostegals. Nomeidae – 2 dorsal fins; pelvic fins present. (S. Kimura)

### *Pampus argenteus* (Euphrasen, 1788)

#### Silver Pomfret

D V–X + 37–43; A V–X + 34–43; P<sub>1</sub> 24–27; GR 10–13; V 34–37. Body oval, strongly compressed. Gill opening short, slit-like. Gill rakers very small, vestigial. Anterior dorsal and anal fins falcate. Caudal fin deeply forked, lower lobe often extended. Sensory canal area on temporal extending backward along lateral line. **Color:** head and body dark brownish silver dorsally, silvery white ventrally. Anal and caudal fins yellowish. **Size:** maximum length 60 cm. **Distribution:** Indo-West Pacific, from Persian Gulf to Indonesia. **Remarks:** found in coastal waters over muddy bottom. Marketed fresh. (S. Kimura)



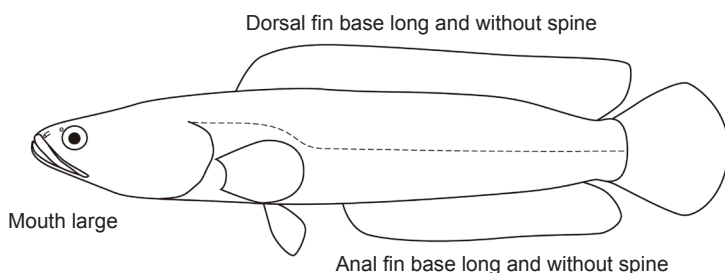
*Pampus argenteus*, KAUM–I. 32755, 14.4 cm SL  
Ang Sila, 23 Oct. 2010

## CHANNIDAE

### Snakeheads

Medium to large sized fishes (maximum size about 130 cm TL). Body elongate. Head depressed. Eye large. Dorsal and anal fin bases long and entirely soft-rayed. Pelvic fin present or absent. Mouth large with well-developed teeth on both upper and lower jaws. Caudal fin rounded to somewhat truncated. Suprabranchial (air-breathing) organ present.

**Color:** highly variable, body including head from brownish, dark brown to dark blue with bands, blotches or spots (including ocelli) in various colors (e.g., red, orange, yellow, gold, blue, black).



**Remarks:** Carnivorous. Feeds on all smaller animals including insects, crustaceans, fish and frogs. Many species utilized as important food fishes in

East and southern Asia. Some species utilized as aquarium fishes.

**Similar families occurring in the area:** None. (P. Musikasinthorn)

#### *Channa lucius* (Cuvier, 1831)

D 37–41; A 25–30; P<sub>1</sub> 16–19; LL 57–70. Body elongate, cylindrical and somewhat compressed. Body depth and width greatest at insertion of anal fin. Head depressed and somewhat conical. Snout pointed in dorsal view. A patch of small scales present at chin region (gular scales). Dorsal and anal-fin bases long. Pelvic fin length more than 50% of pectoral fin length. Large canine-like teeth on vomer and palatine. **Color:** body dark brown with a row of several irregular dark blotches on lateral side of body. Many small black spots scattered on ventral side of body. A large irregular black blotch at posterior portion of gill cover. In juveniles, two bold black longitudinal bands run from tip of snout to the middle of the caudal fin. **Size:** attains about 40 cm SL. **Distribution:** known from Indochina including Malay Peninsula and insular southeast Asia (Sumatra, Borneo and Java). **Remarks:** usually found in freshwater habitats but occasionally caught in tidal river reaches in the flooded (rainy) season. Marketed fresh and dried. (P. Musikasinthorn)



*Channa lucius*, KAUM-I. 23370, 5.7 cm SL  
Bang Pakong, 22 Sept. 2009



*Channa striata*, KAUM-I. 23941, 4.2 cm SL  
Bang Pakong, 30 Sept. 2009

#### *Channa striata* (Bloch, 1793)

##### Striped Snakehead

D 38–47; A 23–29; P<sub>1</sub> 15–19; LL 50–61. Body elongate and cylindrical.

Body depth and width greatest at insertion of anal fin and pectoral fin, respectively. Head depressed and moderately wide. Snout rounded in dorsal view. Gular scales absent at chin region. Dorsal and anal-fin bases long. Pelvic fin length more than 50% of pectoral fin length. No large canine-like teeth on vomer and palatine. **Color:** body dark brown above, extending into irregular dark bands below. Pectoral fins without spots or bands. Juveniles have black markings (sometimes forming ocelli) at posterior end of dor-

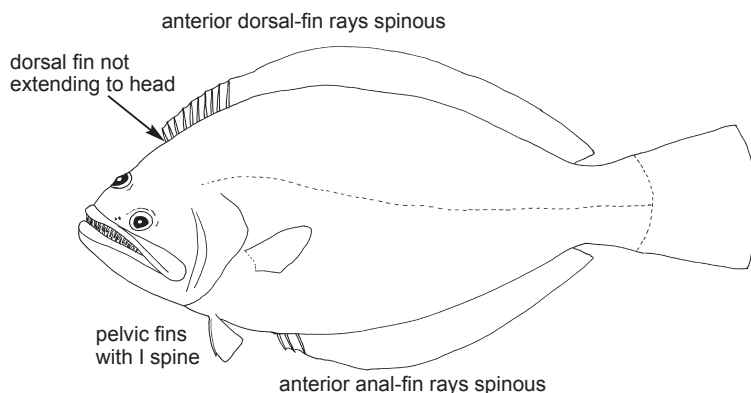
sal fin. **Size:** attains about 60 cm SL. **Distribution:** known from Pakistan through Southeast Asia east to Yunnan, southern China. Introduced and established in subtropical and tropical islands including Taiwan, New Guinea, the Philippines and Sulawesi, Indonesia. **Remarks:** one of the most important and popular freshwater food fishes in southeast Asia. Usually found in freshwater habitats but occasionally caught in tidal river reaches in the flooded (rainy) season. Marketed fresh and dried. (P. Musikasinthorn)

## PSETTODIDAE

### Spiny Turbots

Marine flatfishes in middle size, maximum size ca. 80 cm. Body oval, caudal peduncle deeper than its length. Eyes on right or left side of head. Mouth large, extending well beyond posterior margin of lower eye. Teeth on jaws large canines, many with barbed tips; vomer and palatine with teeth. Margin of preopercle distinct, not covered with skin. Dorsal fin origin well posterior to upper eye. Anterior rays of dorsal and anal fins spinous. Pelvic fin with 1 spine and 5 soft rays, nearly symmetrically placed on each sides of midventral line. Caudal fin with 15 branched rays, separated from dorsal and anal fins. Lateral line on both sides of body, only slightly curved above pectoral fin. Weak ctenoid scales covering both sides of body. Vertebrae usually 10 + 14=24. **Color:** ocular side brownish, blind side pale brown.

**Remarks:** single genus, *Psettodes*, with one species (*P. erumei*) from Indo-West Pacific and two (*P.*



*belcheri* Bennett, 1831 and *P. bennettii* Steindachner, 1870) from western Africa. Occurring in coastal waters. Food fish.

**Similar family occurring in the area:** Psettodidae differs from all other flatfish families in having dorsal fin origin well posterior to upper eye, and anterior rays of dorsal and anal fin spinous. Citharidae – lateral line highly arched above pectoral fin. Paralichthyidae – pelvic fin with-

out spine; lateral line highly arched above pectoral fin. Bothidae – pelvic fin without spine; origin of pelvic fin on eyed side anterior to that on blind side; lateral line highly arched above pectoral fin. Samaridae – pelvic fin on blind side absent. Soleidae – pelvic fin without spine; origin of pelvic fin on eyed side anterior to that on blind side. Cynoglossidae – caudal fin continuous with dorsal and anal fins. (H. Imamura)

#### *Psettodes erumei*

(Bloch & Schneider, 1801)

Indian Halibut

D IX–XI, 38–45; A I, 33–43; P<sub>1</sub> 14–16; P<sub>2</sub> I, 5; LL 61–77. Body oval, strongly compressed. Eyes on right or left side of head. Mouth large, extending well beyond posterior margin of lower eye. Teeth on jaws large canines; vomer and palatine with small conical teeth. Anterior rays of dorsal and anal fin spinous. Caudal fin separated from dorsal and anal fins. Lateral line on both sides of body, only slightly curved above pectoral fin. Scales on small, weakly ctenoid on both sides of body. **Color:** eyed side generally brownish or grayish, sometimes with 4 or 5 broad dark cross bands; dorsal, anal, posterior portion of caudal in darker; blind side pale brown. **Size:** maximum total length about 60 cm,



*Psettodes erumei*, KAUM–I. 32876, 13.8 cm SL  
Gulf of Thailand (SS), 27 Oct. 2010

most commonly 20–40 cm. **Distribution:** Indo-West Pacific, from South Africa and Red Sea to northern Australia, north to Taiwan. **Remarks:** found on sandy and muddy bottoms. Marketed fresh. (H. Imamura)



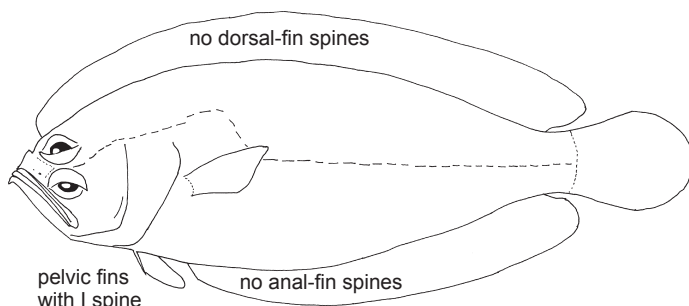
*Psettodes erumei*  
KAUM–I. 33172, 12.8 cm SL  
Gulf of Thailand (SS), 25 Nov. 2010



## CITHARIDAE

### Largescale Flounders

Marine flatfishes in small size, maximum size less than 40 cm. Body elliptical strongly compressed. Eyes on left side of head in some species, on right side in others. Mouth moderate or somewhat large. Small and slender teeth on jaws. Margin of preopercle distinct, not covered with skin. Dorsal fin origin anterior to eyes. Anterior rays of dorsal and anal fins not spinous. Pelvic fin with 1 spine and 5 soft rays, fin bases on both sides short. Caudal fin with 13–15 branched rays, separated from dorsal and anal fins. Lateral line usually present on both sides of body, with high arch above pectoral fin. Body scales large; ctenoid scales on eyed side, weakly ctenoid or cycloid scales on blind side. **Color:** eyed side with some spots on body and fins; blind side whitish.



**Remarks:** five genera, *Brachypleura*, *Citharoides*, *Citharus*, *Lepidoblepharon* and *Paracitharus*, are known from Indo-West Pacific. Usually found on sandy or muddy-sandy bottoms. Food fish.

**Similar family occurring in the area:** Psettodidae – dorsal fin origin well posterior to upper eye; anterior rays of dorsal and anal fin spinous;

lateral line slightly curved above pectoral fin. Paralichthyidae – pelvic fin without spine. Bothidae – pelvic fin without spine; origin of pelvic fin on eyed side anterior to that on blind side. Samaridae – pelvic fin on blind side absent. Soleidae – pelvic fin without spine. Cynoglossidae – caudal fin continuous with dorsal and anal fins. (H. Imamura)

#### *Brachypleura novaezeelandiae* (Günther, 1862)

##### Widemouth Largescale Flatfish

D 65–77; A 41–50; P<sub>1</sub> 11–13 (eyed side), 10–13 (blind side); P<sub>2</sub> I, 5; LL 28–33; GR 5–6 + 7–10. Body elliptical, strongly compressed. Both eyes on right side of body. Head 2.2–2.7 in SL. Mouth large, arched, reaching to or beyond center of lower eye, but not reaching to posterior margin of lower eye. Some anterior rays of dorsal fin elongate in males, not in females. Caudal fin rounded posteriorly. Lateral line usually present on both sides of body, with high arch above pectoral fin. Body scales large; ctenoid scales on eyed side, weakly ctenoid or cycloid scales on blind side. **Color:** eyed side of body yellowish or yellowish brown; dorsal, anal and caudal fins



*Brachypleura novaezeelandiae*, KAUM-I. 23819, 9.2 cm SL  
Gulf of Thailand (SS), 25 Sept. 2009

paler than body, with dark spots; blind side of body whitish. **Size:** maximum total length 14 cm. **Distribution:** Indo-West Pacific, including Maldives Islands, Andaman Sea, and northern

area of South China Sea. **Remarks:** found on sandy and muddy bottoms, at depths of 18 to 73 m. Marketed fresh. (H. Imamura)

*Lepidoblepharon ophthalmolepis*  
Weber, 1913

Scale-eyed Flounder

D 65–70; A 45–48; P<sub>1</sub> 11–12 (eyed side), 11 (blind side); P<sub>2</sub> I, 5; LL 28–33; GR 4–7 + 10–11. Body elliptical, strongly compressed. Both eyes on right side of body. Head 3.0–3.3 in SL. Mouth large, arched, extending below middle of lower eye. Dorsal surface of eye with scales. Anterior rays of dorsal fin not elongate in both males and females. Caudal fin rounded posteriorly. Lateral line present on both sides of body, with high arch above pectoral fin. Body scales large; ctenoid scales on eyed side, cycloid scales on blind side. **Color:** eyed side of body brownish; blind side of body whitish; no distinct dark spot near bases of last dorsal and anal fin rays. **Size:** maximum total length 29 cm. **Distribution:** West Pacific, including southern Japan, Korean Peninsula, Philippines and Gulf of Thailand. **Remarks:** known from depths of 121 to 240 m. Apparently not marketed. (H. Imamura)



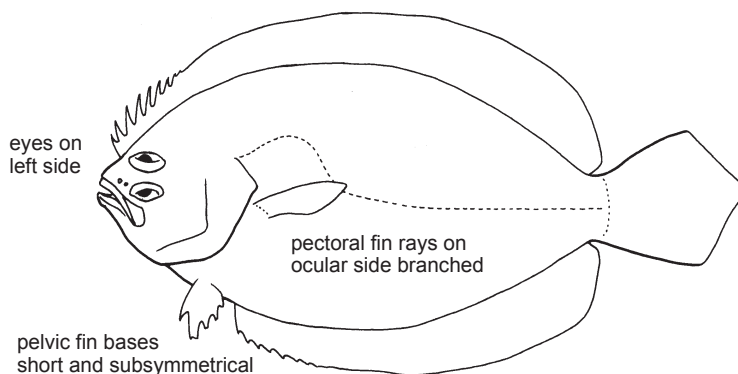
*Lepidoblepharon ophthalmolepis*, KAUM-I. 33226, 8.9 cm SL  
off Chanthaburi (SP), 30 Nov. 2010

## PARALICHTHYIDAE

### Sand Flounders

Body elliptical to oval, strongly compressed, reaching to 40 cm. Head large, 3.0–4.4 in SL. Mouth rather large. Teeth uniserial on both jaws. Eyes on left side of head, separated by a bony ridge. Margin of preopercle distinct, not covered with skin. Dorsal fin origin anterior to eyes. Anterior rays of dorsal and anal fins not spinous. Pelvic fin without spines; pelvic fin bases on both sides short, subequal and subsymmetrical in position. Caudal fin separated from dorsal and anal fins. Lateral line equally developed on both sides of body, with high arch above pectoral fin and supratemporal branch, running upward to anterior part of dorsal fin. Body scales large; ctenoid scales on eyed side, weakly ctenoid or cycloid scales on blind side. **Color:** body brownish or light greenish with dark spots or rings.

**Remarks:** most species known



from shallow sandy and muddy bottoms of continental shelf; some species from brackish waters near river mouths.

**Similar family occurring in the area:** Psettodidae – dorsal fin origin well posterior to upper eye; anterior rays of dorsal and anal fin spinous; pelvic fin with one spine; lateral line

slightly curved above pectoral fin. Citharidae – pelvic fin with one spine. Bothidae – origin of pelvic fin on eyed side anterior to that on blind side. Samaridae – pelvic fin on blind side absent. Soleidae – eyes on left side of head. Cynoglossidae – caudal fin continuous with dorsal and anal fins. (H. Imamura)

### *Pseudorhombus arsius* (Hamilton, 1822)

#### Large-tooth Flounder

D 71–84; A 53–62; P<sub>1</sub> 12–13 (eyed side); LL 69–81. Body oval. Head 3.3–3.6 in SL; upper profile of head with a slight notch anterior to upper eye. Upper jaw extending to below posterior margin of lower eye. Several pairs of moderately large canine teeth in anterior part of both jaws. Scales ctenoid on eyed side, cycloid on blind side. **Color:** body greenish or light brown; a dark blotch at junction of straight and curved parts of lateral line; a smaller blotch halfway to caudal fin base. **Size:** maximum standard length 45 cm, commonly to 30 cm. **Distribution:** widespread in Indo-West Pacific, from eastern coast of Africa eastward to Australia and Fiji. **Remarks:** found from shallow muddy-sandy or muddy bottoms from coastal areas to river mouths.

(H. Imamura)



*Pseudorhombus arsius*, KAUM-I. 23188, 12.3 cm SL  
Gulf of Thailand (SS), 8 Sept. 2009



***Pseudorhombus javanicus*  
(Bleeker, 1853)**

Javan Flounder

D 67–76; A 51–56; P<sub>1</sub> 11–12 (eyed side); LL 66–74. Body oval. Head 3.2–3.6 in SL; upper profile of head without notch anterior to upper eye. Upper jaw extending to below middle of lower eye. Teeth on both jaws small, with slightly enlarged teeth anteriorly. Scales ctenoid on anterior part, and dorsal and ventral margins of body of eyed side; those on other areas of eyed side and blind side cycloid.

**Color:** body brownish, with a distinct, large dark blotch at junction of straight and curved parts of lateral line, and a smaller blotch on middle of straight section of lateral line. **Size:** maximum standard length 35 cm, commonly to 20 cm. **Distribution:** Indo-West Pacific, from eastern coast of India eastward to western New Guinea and to southern China. **Remarks:** found from shallow waters on mud and sand bottoms of continental shelf.

(H. Imamura)



*Pseudorhombus javanicus*, KAUM-I. 22895, 10.1 cm SL  
Ang Sila, 31 Aug. 2009

***Pseudorhombus oligodon*  
(Bleeker, 1854)**

Roughscale Flounder

D 78–82; A 61–64; P<sub>1</sub> 12–13 (eyed side), 11–12 (blind side); LL 80–90. Body oval. Head 3.5–3.8 in SL; upper profile of head with a shallow notch anterior to upper eye. Upper jaw extending to below middle or posterior part of lower eye. Scales small, ctenoid on both sides of body. Lateral line well developed on both sides of body. **Color:** eye side of body greenish brown, with a dark blotch at junction between straight and curved portions of lateral line; 2 dark spots below base of pectoral fin; blind side of body yellowish white. **Size:** maximum SL 30 cm, commonly 10–20 cm. **Distribution:** West Pacific, from Japan to South China Sea. **Remarks:** found from mud and sand bottoms of continental shelf in 30–40 m depth.

(H. Imamura)



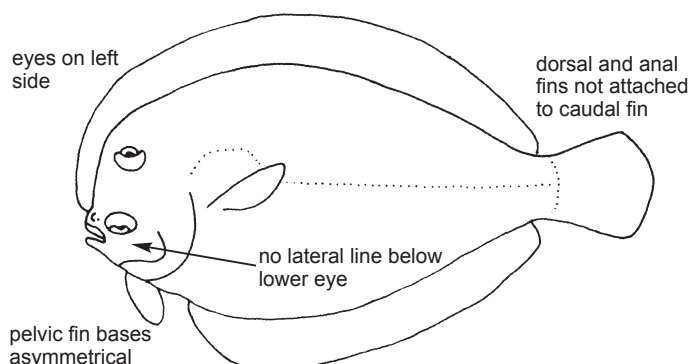
*Pseudorhombus oligodon*, KAUM-I. 47766, 11.2 cm SL  
Prachuap Khiri Khan, 21 July 2012

## BOTHIDAE

### Lefteye Flounders

Marine flatfishes. Body elliptical to oval, strongly compressed, reaching to 88 cm. Mouth small to large. Eyes on left side of head. Interorbital width variable; males of some species with wider interorbit than female. Margin of preopercle distinct, not covered with skin. Dorsal fin origin above or ahead of anterior margin of upper eye. Anterior rays of dorsal and anal fins not spinous. Pelvic fin without spines; pelvic fin of eyed side on midventral line with origin anterior to origin of pelvic fin of blind side; pelvic fin of blind side above midventral line. Caudal fin separated from dorsal and anal fins. Lateral line on eyed side highly arched above pectoral fin; lateral line absent below lower eye. **Color:** eyed side of body brownish, usually with spots, blotches, or rings; blind side of body whitish, but dark colored in some species.

**Remarks:** usually found on sand



dy and muddy bottoms, but some species on rocky or coral reefs. Feeds on small fishes, crustaceans, gastropods and other benthic animals. Twenty genera. Food fish.

**Similar family occurring in the area:** Psettodidae – dorsal fin origin well posterior to upper eye; anterior rays of dorsal and anal fin spinous; pelvic fin with one spine; lateral line

slightly curved above pectoral fin. Citharidae – pelvic fin with one spine. Paralichthyidae – pelvic fin bases on both sides short, subequal and subsymmetrical in position. Samaridae – pelvic fin on blind side absent. Soleidae – eyes on left side of head. Cynoglossidae – caudal fin continuous with dorsal and anal fins. (H. Imamura)

### *Arnoglossus aspilos* (Bleeker, 1851)

#### Spotless Lefteye Flounder

D 80–84; A 59–64; P<sub>1</sub> 11–12 (eyed side); LL 46–48. Body rather deep. Head 3.7–4.1 in SL; upper profile of head with a notch anterior to eyes. Eyes separated by a space less than half eye diameter. Upper jaw extending slightly beyond anterior margin of lower eye. Teeth on jaws small and uniserial. Body scales ctenoid on eyed side, cycloid on blind side. **Color:** body finely mottled brown with small blackish spots on rays of median fins; the largest spot on each outer branched rays of caudal fin. **Size:** attains 8.5 cm. **Distribution:** Indo-West Pacific, including Oman, Arabian Gulf, Indonesia, Singapore and Gulf of Thailand. (H. Imamura)



*Arnoglossus aspilos*, KAUM-I. 32787, 6.4 cm SL  
Ang Sila, 23 Oct. 2010

***Engyprosopon grandisquama***  
(Temminck & Schlegel, 1846)

Largescale Flounder

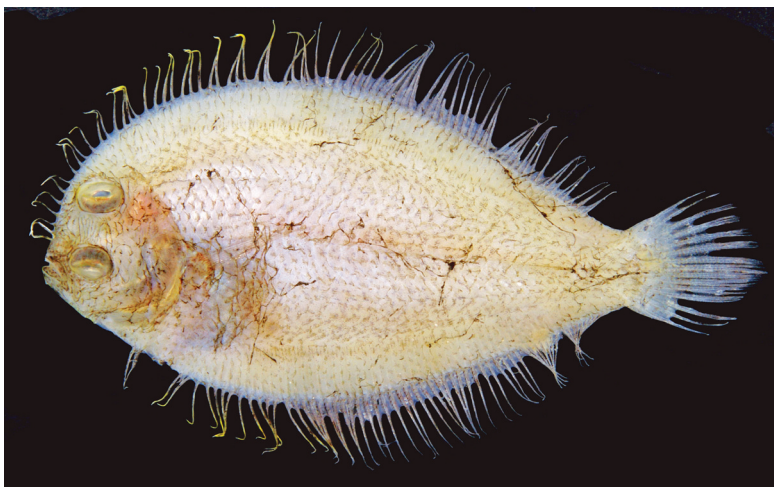
D 80–91; A 57–69; P<sub>1</sub> 10–13 (eyed side); LL 41–48. Body oval. Head 3.5–4.2 in SL; upper profile of head with a slight concavity anterior to upper margin of lower eye. Single strong rostral spine near snout in males, absent or feeble in females. Upper jaw extending to below anterior portion of lower eye. Teeth on upper jaw biserial, those on lower jaw uniserial. Scales large, with short ctenii on eyed side, cycloid on blind side. **Color:** eyed side light brown, many dark spots and rings irregularly scattered on it; caudal fin with a pair of large prominent jet-black blotches. **Size:** maximum standard length about 11 cm, commonly to 8 cm. **Distribution:** Indo-West Pacific, including East Africa, southern Japan and northern Australia. **Remarks:** found from mud and sand bottoms of continental shelf, at depths of 10–100 m. (H. Imamura)



*Engyprosopon grandisquama*, KAUM-I. 33173, 6.8 cm SL  
Gulf of Thailand (SS), 25 Nov. 2010

***Engyprosopon longipelvis***  
Amaoka, 1969

D 79–83; A 60–64; P<sub>1</sub> 11–12 (eyed side), 8–10 (blind side); LL 37–42; GR 0 + 6–7. Body elliptical. Head 3.5–3.9 in SL. Snout obtuse, strongly protruding. Single strong rostral spine on snout in males, absent or feeble in females. Interorbit shallowly concave, wider in males than in females. Upper jaw extending to below anterior 1/3 or middle of lower eye. Teeth on upper jaw biserial, those on lower jaw uniserial. Scales rather large, with feeble ctenii on eyed side, cycloid on blind side. **Color:** eyed side of body light brown; all fins irregularly scattered blackish spots; blind side of body milky white. **Size:** maximum SL about 7 cm. **Distribution:** only from southern Japan, West Pacific. **Remarks:** found from sandy-muddy bottoms shallower than 30 m. (H. Imamura)



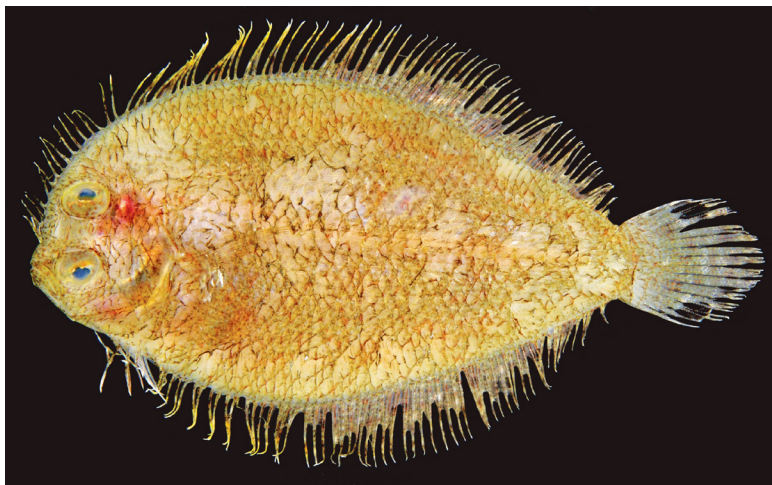
*Engyprosopon longipelvis*, KAUM-I. 22898, 6.4 cm SL  
Ang Sila, 31 Aug. 2009



*Engyprosopon multisquama*  
Amaoka, 1963

D 83–96; A 62–73; P<sub>1</sub> 9–11 (eyed side), 9–10 (blind side); LL 45–50; GR 0 + 5–8. Body rather deep. Head 4.0–4.8 in SL. Snout short. Single strong rostral spines on snout in males, absent or feeble in females. Interorbit wider in males than in females. Upper jaw extending to slightly beyond anterior margin of pupil of lower eye. Teeth on upper jaw biserial, those on lower jaw uniserial. Scales large, slightly ctenoid on eyed side, cycloid on blind side. **Color:** eyed side of body pale grayish green; all fins irregularly scattered blackish spots; blind side of body light gray in males, milky white in females; caudal fin with a pair of large prominent jet-black blotches. **Size:** maximum SL about 14 cm. **Distribution:** only from southern Japan, West Pacific. **Remarks:** found from sandy-muddy bottoms from 20 to 40 m.

(H. Imamura)



*Engyprosopon multisquama*, KAUM-I. 23826, 6.5 cm SL  
Gulf of Thailand (SS), 25 Sept. 2009

*Grammatobothus polyophthalmus*  
(Bleeker, 1865)

Maneyed Flounder

D 77–86; A 61–71; P<sub>1</sub> 14–17 (eyed side); LL 75–77. Body oval. Head 3.5–4.0 in SL; upper profile of head with a deep notch anterior to interorbital region. Upper jaw reaching to or slightly beyond below anterior portion of lower eye. Teeth on both jaws uniserial. 2nd to 10th dorsal fin rays elongate in both sexes, longer in males than females. Pectoral fin elongate in males. Lateral line on both sides of body. Scales on eyed side ctenoid, those on blind side cycloid. **Color:** eyed side pale brownish, with 3 large and prominent dark ocelli, 1 each above and below pectoral fin, 1 on middle of strait section of lateral line. **Size:** maximum total length about 21 cm, most specimens about 17 cm. **Distribution:** Indo-West Pacific, including India, Ryukyu Islands, Philippines and northwestern Australia. **Remarks:** inhabits on mud, sand and rubble bottoms at depths of 0–90 m.

(H. Imamura)



*Grammatobothus polyophthalmus*, KAUM-I. 32823, 12.3 cm SL  
Gulf of Thailand (SP), 25 Oct. 2010

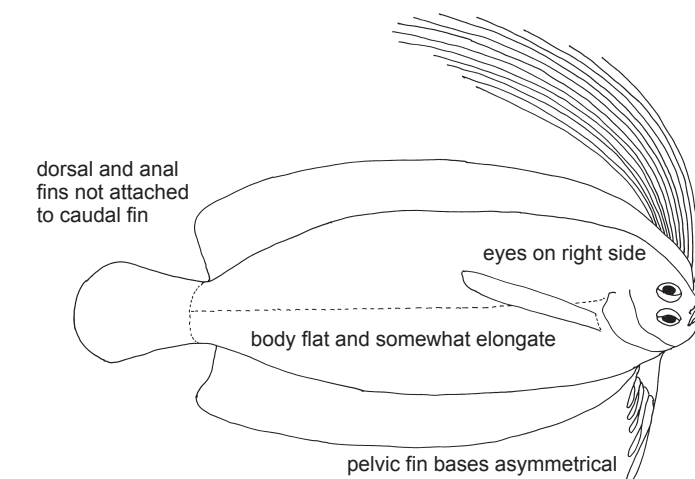
## SAMARIDAE

### Crested Flounders

Marine flatfishes, maximum size smaller than 22 cm. Body elliptical to somewhat oval, strongly compressed. Mouth small, reaching to almost anterior margin of upper eye. Eyes on right side of head. Margin of preopercle distinct, not covered with skin. Dorsal fin origin anterior to anterior margin of upper eye. Anterior rays of dorsal and anal fins not spinous. Pectoral fin present on eyed side but absent on blind side. Pelvic fins symmetrical, without spines. Caudal fin separated from dorsal and anal fins. Lateral line well developed or rudimental. **Color:** eyed side of body brownish, usually with spots, blotches, or rings; blind side of body whitish.

**Remarks:** known from tropical and subtropical regions in Indo-Pacific, primarily deeper waters. Three genera, *Plagiopsetta*, *Samaris* and *Samariscus*, with about 20 species.

**Similar family occurring in the area:** Psettodidae – dorsal fin origin



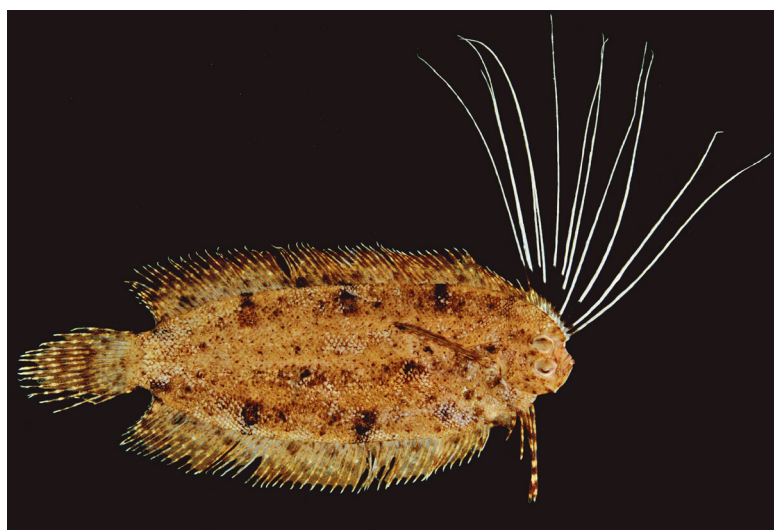
well posterior to upper eye; anterior rays of dorsal and anal fin spinous; pelvic fin with one spine; lateral line slightly curved above pectoral fin. Citharidae – pelvic fin with one spine. Paralichthyidae – eyes on left side of head, pelvic fin bases on both sides

short, subequal and subsymmetrical in position. Bothidae – eyes on left side of head. Soleidae – preopercle without free margin. Cynoglossidae – eyes on left side of head; preopercle without free margin; pectoral fins absent. (H. Imamura)

### *Samaris cristatus* Gray, 1831

#### Cockatoo Righteye Founder

D 71–85; A 49–60; P<sub>1</sub> 4 (eyed side); LL 60–80. Body elliptical. Head 3.8–5.3 in SL; upper profile of head with a slight notch anterior to upper eye. Mouth small; upper jaw extending to below anterior portion of lower eye. Both jaws with small villiform teeth in band. Anterior 12 or 13 rays greatly elongate and filamentous. Pectoral fin on eyed side somewhat elongate. Pelvic fin on eyed side continuous with anal fin by membrane. Lateral line present only on eyed side. Scales on eyed side ctenoid, those on blind side feebly ctenoid or cycloid. **Color:** eyed side pale brownish, with a series of obscure dark blotches along dorsal and ventral margins of body; blind side whitish. **Size:** maximum length 22 cm. **Distribution:** Indo-West Pacific, from southeastern Africa to New



*Samaris cristatus*, KAUM–I. 33219, 13.2 cm SL  
off Chantha Buri (SP), 30 Nov. 2010

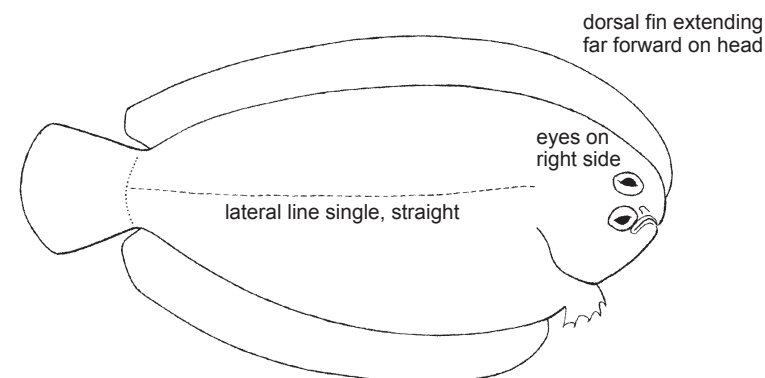
Caledonia, north to Japan and south to northern Australia. **Remarks:** found from mud and sand bottoms.

(H. Imamura)

## SOLEIDAE

### Soles

Marine flatfishes (excepting one species entering rivers in Africa), reaching to 32 cm. Body somewhat elongate to oval, strongly compressed. Mouth small and asymmetrical, terminal or slightly inferior. Eyes on right side of head. Preopercle without free margin, embedded in skin. Dorsal fin origin anterior to upper eye. Anterior rays of dorsal and anal fins not spinous. Pectoral fins sometimes absent; when present, eyed side pectoral fin usually longer than blind side pectoral fin. Pelvic fins without spines, sometimes asymmetrical, either free or fused with anal fin. Caudal fin separated from or fused with dorsal and anal fins. Lateral line single, running straight on body, sometimes branched on head. **Color:** highly variable according to substratum, uniformly dull brown to strikingly colored with scattered black spots or blotches or dark cross bands on eyed side of body; usually



uniformly yellowish or white on blind side of body.

**Similar family occurring in the area:** Soleidae differs from all other flatfish families, except for Cynoglossidae, in lacking free preopercular margin. Psettodidae – dorsal fin origin well posterior to upper eye; anterior rays of dorsal and anal fin spinous; pelvic fin with one spine; lateral line

slightly curved above pectoral fin. Citharidae – pelvic fin with one spine. Paralichthyidae, Bothidae and Cynoglossidae – eyes on left side of head.

**Remarks:** inhabits muddy and sandy bottom in coastal areas. About 35 genera with about 130 species.

(H. Imamura)

#### *Aseraggodes filiger* Weber, 1913

D 73; A 50; P<sub>2</sub> 4 (eyed side); LL ca. 76. Body elliptical. Head 4.3 in SL. Mouth small, curved. Snout blunt. Eyes attached with each other. First dorsal fin ray somewhat elongate. Pectoral fins absent. Pelvic fin separated from anal fin. Caudal fin separated from dorsal and anal fins. **Color:** eyed side pale brown, with several dark blotches including many paler small spots; blind side uniformly white, without blotches or spots. **Size:** attains 11 cm. **Distribution:** known only from Gulf of Thailand, Indonesia and Philippines, West Pacific.

(H. Imamura)



*Aseraggodes filiger*, KAUM-I. 32788, 7.6 cm SL  
Ang Sila, 23 Oct. 2010



***Aseraggodes kobensis***  
(Steindachner, 1896)

D 64–74; A 45–55; C 17–19; LL 53–71. Body elliptical. Eyes small, close together. Anterior nasal tube short, not reaching anterior rim of lower eye, when tube depressed posteriorly. Mouth small, slightly curved. Pectoral fins absent on both sides. Pelvic fin separated from anal fin. Caudal fin separated from dorsal and anal fins. **Color:** eyed side uniformly pale brown; blind side uniformly paler, somewhat dusky. **Size:** attains 10 cm SL. **Distribution:** West Pacific, from southern Japan to South China Sea.

(H. Imamura)

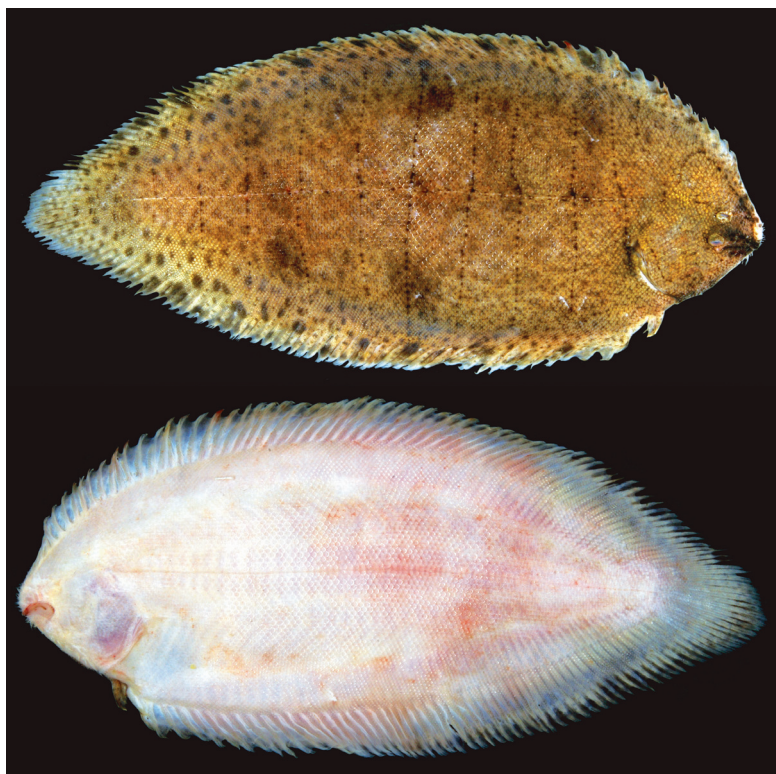


*Aseraggodes kobensis*, KAUM-I. 33227, 7.3 cm SL  
off Chantha Buri (SP), 30 Nov. 2010

***Brachirus panoides***  
(Bleeker, 1851)

D 82; A 63; LL 90–100. Body rather deep. Mouth small, slightly curved. Eyes narrowly separated. Pectoral fins rudimentary. Pelvic fin separated from anal fin. Caudal fin continuous with dorsal and anal fins. Scales ctenoid on eyed side. **Color:** body of eyed side brown, with several vertical lines formed by small blackish dots; dorsal and ventral margins of body, and dorsal and anal fins on eyed side with numerous small dark spots; body of blind side white. **Size:** attains 20 cm. **Distribution:** known only from Thailand and Indonesia, West Pacific. **Remarks:** found along bottom in estuaries and in lower courses of rivers.

(H. Imamura)



*Brachirus panoides*, KAUM-I. 33187, 13.9 cm SL  
Bang Pakong, 26 Nov. 2010

***Liachirus melanospilos***  
(Bleeker, 1854)

Darkspotted Sole

D 59–62; A 42–47; LL 57–65. Body oval, 2.1–2.4 in SL. Head 3.9–4.2 in SL. Mouth small, slightly curved. Eyes separated by a scaly interorbital space. Pectoral fins absent. Pelvic fin separated from anal fin. Caudal fin separated from dorsal and anal fins. Scales on both sides small cycloid. **Color:** eyed side light to dark brown with scattered darker dots and blotches; blind side pale. **Size:** attaining to 7.5 cm SL. **Distribution:** Indo-West Pacific, including South China Sea, southern Japan and Australia. **Remarks:** inhabits on mud and sand bottoms around 100 m depth.

(H. Imamura)

***Pardachirus pavoninus***  
(Lacepède, 1802)

Peacock Sole

D 66–70; A 50–53; LL 75–82. Body oval. Mouth strongly curved, cleft reaching to anterior margin of lower eye. Eyes separated by a scaly interorbital space. Pectoral fins absent. Pelvic fin separated from anal fin. Caudal fin separated from dorsal and anal fins. Lateral line distinct, straight, single. Series of toxin glands with pores along bases of dorsal and anal fin rays. **Color:** eyed side reddish brown, densely spotted on head, body and fins; spots in various sizes and shapes, bordered by a dark rim and some with a blackish spot in center. **Size:** maximum total length about 22 cm, commonly 10–15 cm. **Distribution:** widespread tropical Indo-West Pacific, including southern Japan, Philippines and Australia. **Remarks:** inhabits on sandy bottoms of coral reef areas, at depths of about 40 m. (H. Imamura)

***Solea ovata***  
Richardson, 1846

Ovate Sole

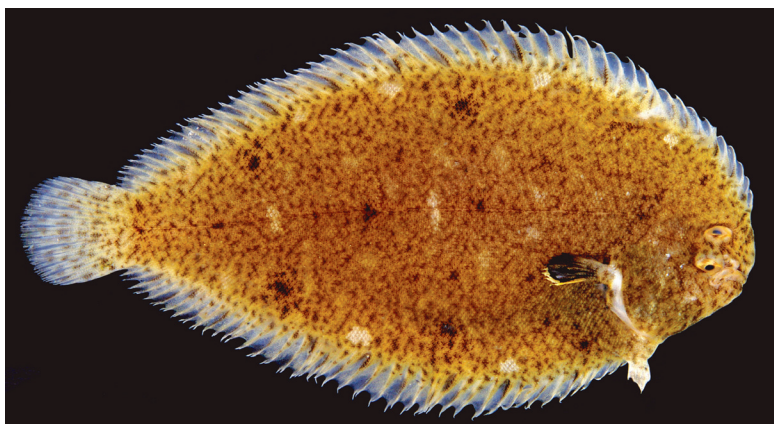
D 65; A 47. Body ovate. Mouth small, curved. Eyes separated by a small concave interorbital space. Pectoral fin on eyed side about twice as long as that on blind side. Pelvic fins present on both sides. Caudal fin separated from dorsal and anal fins. Scales ctenoid on both sides. **Color:** body and fins on eyed side olive or brown



*Liachirus melanospilos*, KAUM-I. 47702, 9.0 cm SL  
Rayong, 11 July 2012



*Pardachirus pavoninus*, KAUM-I. 32877, 19.6 cm SL  
Gulf of Thailand (SS), 27 Oct. 2010



*Solea ovata*, KAUM-I. 23207, 7.3 cm SL  
Gulf of Thailand (SS), 8 Sept. 2009

with spots and black blotches; deep black blotches on outer two-thirds of pectoral fins. **Size:** maximum total length about 10 cm, commonly 8–9 cm. **Distribution:** Indo-West Pacific,

including Pakistan, New Guinea, Gulf of Thailand, Indonesia, Philippines and China. **Remarks:** found from shallow sand or mud bottoms in coastal waters. (H. Imamura)



***Synaptura commersonii***  
(Lacepède, 1802)

Commerson's Sole

D 70–83; A 59–65; C 12; LL 124–172. Body elongate, tapering posteriorly. Mouth curved. Eyes separated by a small concave interorbital space. Pectoral fins symmetrical in size. Pelvic fins short and bases asymmetrical in position. Caudal fin continuous with dorsal and anal fins. Scales ctenoid on eyed side, cycloid on blind side. **Color:** body on eyed side gray or brown; dorsal, anal and caudal fins dusky towards edges of both sides and with a conspicuous white margin; right pectoral fin dusky. **Size:** maximum total length about 32 cm, commonly 20–30 cm. **Distribution:** Indo-West Pacific, including Pakistan, Gulf of Thailand, Borneo and Indonesia. **Remarks:** inhabits mainly sand or mud bottoms in coastal waters.

(H. Imamura)



*Synaptura commersonii*, KAUM-I. 33012, 22.0 cm SL  
Gulf of Thailand (SS), 3 Nov. 2010

***Zebrias quagga***  
(Kaup, 1858)

Zebra Sole

D 60–75; A 50–62. Body elliptical. Mouth small, terminal, slightly curved. Eyes contiguous, each with a short tentacle. Pectoral fins well developed. Pelvic fin separated from anal fin. Caudal fin continuous with dorsal and anal fins. Scales ctenoid. **Color:** eyed side cream or beige with 11–12 brown single or double crossbands, slightly wider than interspaces; body pattern continued onto dorsal and anal fins; caudal fin cream with elongate black blotches. **Size:** maximum length 15 cm. **Distribution:** Indo-West Pacific, including Red Sea, Persian Gulf, Malaysia, Thailand, China and Australia. **Remarks:** found from mud and sand bottoms in shallow coastal waters.

(H. Imamura)



*Zebrias quagga*, KAUM-I. 47762, 10.2 cm SL  
Prachuap Khiri Khan, 21 July 2012



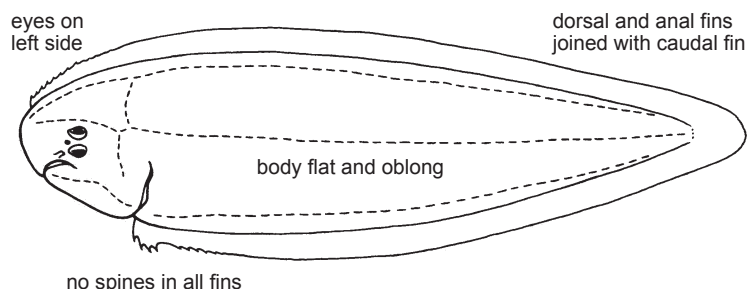
## CYNOGLOSSIDAE

### Tonguesoles

Marine flatfishes (some species entering freshwater), reaching to 40 cm. Body tongue shaped, strongly compressed. Mouth small, subterminal and asymmetrical, reaching posteriorly below lower eye. Eyes on left side of head. Posterior margin of preopercle strongly attached to opercle, without free margin and embedded in skin. Dorsal fin reaching far forward on head. Anterior rays of dorsal and anal fins not spinous. Pectoral fins absent. Usually only pelvic fin on blind side present. Caudal fin separated fused with dorsal and anal fins. Scales small, ctenoid or cycloid.

**Color:** variable even in a species, usually brownish or grayish, often variably marked with spots, blotches or cross bands on eyed side of body; usually uniformly yellowish or whitish on blind side of body.

**Remarks:** commonly found on muddy bottoms and other substrates, from tide pools to deep waters on



continental shelves and slopes. Marketed fish. Includes 3 genera and about 130 species.

**Similar family occurring in the area:** Cynoglossidae differs from all other flatfish families in this area, except for Soleidae, in having caudal fin fused with dorsal and anal fins, and lacking free preopercular margin. It is also separable from most flatfishes

in lacking pectoral fins. Psettodidae – dorsal fin origin well posterior to upper eye; anterior rays of dorsal and anal fin spinous; pelvic fin with one spine; lateral line slightly curved above pectoral fin. Citharidae – pelvic fin with one spine. Samaridae and Soleidae – eyes on right side of head.

(K. Matsuura)

#### *Cynoglossus arel* (Bloch & Schneider, 1801)

##### Largescale Tonguesole

D 116–130; A 85–98; P<sub>2</sub> 4; LL 56–70 (midlateral line); V 50–57. Body elongate, strongly compressed. Snout long, obtusely pointed. Mouth small, reaching to or beyond posterior margin of lower eye. Both eyes on left side of head; interorbital space narrow with scales. Caudal fin usually with 10 rays. Scales large, ctenoid on eyed side, cycloid on eyeless side. Two lateral lines on eyed side of body; upper one along dorsal-fin base, lower one midlaterally on body; none on eyeless side. **Color:** eyed side of body almost uniformly brownish; eyeless side of body whitish. **Size:** maximum length 40 cm. **Distribution:** Indo-West Pacific, from Red Sea to Indonesia excluding New Guinea, north to southern Japan. **Remarks:** inhabits sandy and muddy bottoms. Marketed fresh or dried. (S. Kimura)



*Cynoglossus arel*, KAUM-I. 23049, 15.2 cm SL  
Gulf of Thailand (SS), 3 Sept. 2009

***Cynoglossus bilineatus***  
(Lacepède, 1802)

Fourlined Tonguesole

D 107–113; A 80–88; C usually 12; LL 88–96 (midlateral line). Body elongate, 3.5–4.5 in SL. Mouth moderate, extending beyond lower eye. Eyes small, slightly larger than interorbital space. Two lateral lines on each side of body; upper one along dorsal fin base, lower one midlaterally on body. Scales ctenoid on eyed side and cycloid on blind side. **Color:** eyed side of body pale brown; blind side of body whitish. **Size:** maximum length 40 cm. **Distribution:** Indo-West Pacific, from Persian Gulf to New Guinea, north to southern Japan, south to Australia. **Remarks:** inhabits sandy and muddy bottoms at depths of 13 to ca. 400 m.

(H. Imamura)



*Cynoglossus bilineatus*, KAUM-I. 32754, 10.5 cm SL  
Bang Pakong, 23 Oct. 2010

***Cynoglossus cynoglossus***  
(Hamilton, 1822)

Bengal Tonguesole

D 94–104; A 72–79; C 10; LL 70–80. Body elongate, strongly compressed. Snout rounded; rostral hook short. Two lateral lines on eyed side of body, none on blind side. Scales on both sides of body ctenoid. **Color:** eyed side of body uniformly brown-gray, with indistinct dark markings. **Size:** maximum 20 cm, commonly to 15 cm. **Distribution:** tropical Indo-West Pacific from Pakistan eastward to Indonesia, northward to the Philippines; not found in New Guinea or northern Australia. **Remarks:** found on muddy and sandy bottoms in shallow waters, including estuaries and brackish waters; marketed fresh or frozen, also dried-salted.

(K. Matsuura)



*Cynoglossus cynoglossus*, KAUM-I. 22897, 9.3 cm SL  
Ang Sila, 31 Aug. 2009

***Cynoglossus lingua***  
**Hamilton, 1822**

Long Tonguesole

D 126–138; A 97–114; C usually 10; LL 90–101 (midlateral line). Body very elongate, 4.5–5.9 in SL. Mouth moderate, extending well beyond posterior margin of lower eye. Eyes separated by narrow interorbital space. Two lateral lines present on eyed side of body; upper one along dorsal fin base, lower one midlaterally on body. Lateral lines absent on blind side of body. Scales comparatively large, ctenoid on eyed side and cycloid on blind side. **Color:** eyed side of body reddish brown, sometimes with irregular brown-black



*Cynoglossus lingua*, KAUM-I. 33092, 25.0 cm SL  
Prachuap Khiri Khan, 13 Nov. 2010

patches, with a large black blotch on opercular region. **Size:** maximum total length about 40 cm. **Distribution:** Indo-West Pacific, including Red Sea, Gulf of Thailand, Philippines and In-

donesia. **Remarks:** inhabits mainly shallow sandy and muddy bottoms on inner continental shelf, often entering estuaries. (H. Imamura)

***Cynoglossus puncticeps***  
**(Richardson, 1846)**

Speckled Tonguesole

D 90–100; A 72–78; C 10 (usually); LL 78–99 (midlateral line). Body elongate. Angle of jaws not reaching posteriorly beyond vertical through posterior margin of lower eye. Eyes with a narrow interorbital space. Two lateral lines present on eyed side of body; upper one along dorsal fin base, lower one midlaterally on body. Lateral lines absent on blind side of body. Scales ctenoid on both sides of body. **Color:** eyed side of body yellow brown, with very distinct irregular dark brown blotches, often forming irregular cross bands. **Size:** maximum total length about 18 cm, commonly 8–10 cm. **Distribution:** Indo-West Pacific, including Gulf of Thailand, Australia, New Guinea, Philippines and Taiwan.

(H. Imamura)



*Cynoglossus puncticeps*, KAUM-I. 33098, 11.3 cm SL  
Prachuap Khiri Khan, 13 Nov. 2010

***Paraplagusia blochii***  
**(Bleeker, 1851)**

Bloch's Tonguesole

D 99–105; A 76–82; C 8; LL 75–83 (midlateral line). Body elongate, 3.6–3.8 in SL. Mouth extending to below posterior margin of lower eye. Eyes small, separated by a scaly interorbital space about equal to eye diameter.



*Paraplagusia blochii*, KAUM-I. 23387, 9.9 cm SL  
Bang Pakong, 22 Sept. 2009

Two lateral lines present on eyed side of body; lateral lines absent on blind side of body. Scales ctenoid on eyed side and weakly ctenoid on blind side. **Color:** eyed side of body brown; scale

centers paler than edges. **Size:** maximum length 22 cm. **Distribution:** Indo-West Pacific, including Oman, India, Indonesia and Philippines.

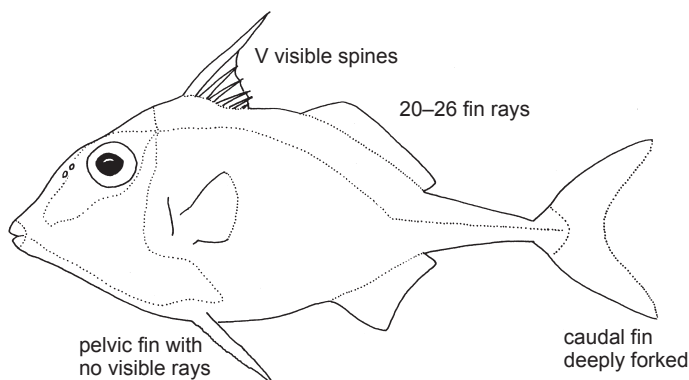
(H. Imamura)



## TRICANTHIDAE

### Triplespines

Small fishes less than 30 cm, with moderately elongate, strongly compressed body covered by moderately thick skin with numerous minute scales. Mouth small and terminal; teeth in an outer series of about 10 heavy incisors in each jaw, internally to which are several molariform teeth, usually 4 in upper jaw and 2 in lower jaw. Gill opening a moderately short vertical slit in front of pectoral-fin base. Dorsal fin spine VI (usually only V visible, the sixth rudimentary), dorsal-fin rays 20 to 26; caudal fin deeply forked; pelvic fins with I large spine and no visible rays; most dorsal-, anal, and pectoral-fin rays branched. Caudal peduncle distinctly tapering to a narrow transversely indented region just in front of caudal-fin base, where the peduncle is wider than deep. Lateral line inconspicuous. **Color:** generally



silvery, with upper half of body dusky, with or without darker blotches.

**Remarks:** benthic, occurring usually on flat, sandy or weed-covered bottoms. Feed on bottom invertebrates. Marketed but not commercially important.

**Similar families occurring in the**

**area:** Triacanthodidae – caudal fin not deeply forked, rounded to almost truncate; caudal peduncle not distinctly tapered, deeper than wide; dorsal-fin rays 12 to 18 (20 to 26 in Triacanthidae). (K. Matsuura)

### *Pseudotriacanthus strigilifer* (Cantor, 1849)

#### Long-spined Tripodfish

D XI + 20–24; A 13–17; P<sub>1</sub> 12–15. Pelvis distinctly tapered posteriorly. Second dorsal spine more than half of first dorsal spine. **Color:** Body silvery gray with several golden bronze blotches; membrane between first and second dorsal spines pale but black distally; second dorsal, anal, pectoral and caudal fins pale. **Size:** maximum 25 cm. **Distribution:** widely distributed in tropical Indo-West Pacific from Gulf of Oman eastward to Indonesia. **Remarks:** occurring in sandy and muddy bottom at depths of 10–60 m. (K. Matsuura)



*Pseudotriacanthus strigilifer*, KAUM-I. 23862, 13.2 cm SL  
Gulf of Thailand (SS), 26 Sept. 2009

***Triacanthus biaculeatus***  
(Bloch, 1786)

Shortnosed Tripodfish

D VI + 21–26; A 17–22; P<sub>1</sub> 12–16. Pelvis not distinctly tapered to a point posteriorly. Doral profile of head from first dorsal-fin spine to above eye slightly convex. **Color:** dorsal half of body silvery light brown, ventral half silvery white; a large black blotch beneath spiny dorsal-fin base which continues over most spiny dorsal-fin membrane; soft dorsal and anal fins pale; pectoral and caudal fins yellow. **Size:** maximum length 30 cm. **Distribution:** widespread in Indo-West Pacific, from Persian Gulf eastward through Bay of Bengal to eastern Australia, northward to southern Japan. **Remarks:** coastal and estuarine waters, on sandy or muddy flat; feeds on benthic invertebrates. (K. Matsuura)



*Triacanthus biaculeatus*, KAUM-I. 32906, 14.2 cm SL  
Bang Pakong, 30 Oct. 2010

***Tripodichthys blochi***  
(Bleeker, 1852)

Longtail Tripodfish

D VI + 20–24; A 15–19; P<sub>1</sub> 13–15. Scale covered ventral surface of pelvis distinctly tapered to a point posteriorly. Second dorsal spine much less than half the length of first dorsal spine. Pelvis between bases of pelvic spines narrow (1.4–3.0% SL), the width 7.2–12.4 (usually about 9 or 10) times in length of pelvis. Dorsal rays modally 22 and anal rays modally 17. **Color:** dorsal half of body silvery light brown, ventral half silvery white; several irregular dark yellow markings on side of body; spiny dorsal fin membrane pale; basal part of spiny dorsal fin yellowish orange; soft dorsal, anal and pectoral fins pale; caudal fin light yellow. **Size:** 15 cm. **Distribution:** known from China and countries in Southeast Asia, a stray found from southern Japan. **Remarks:** coastal and estuarine shallow waters at depths of 0–40 m; usually found on sandy or muddy flat; feeds on benthic invertebrates. (K. Matsuura)

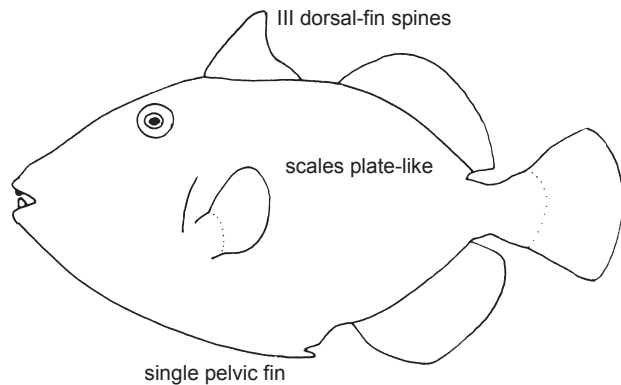


*Tripodichthys blochi*, KAUM-I. 33127, 8.2 cm SL  
Bang Sean, 19 Nov. 2010

## BALISTIDAE

### Triggerfishes

Small or medium-sized fishes, up to 80 cm in total length, with deep, moderately compressed body encased with very thick, tough skin with large scale plates easily discernible as individual units, scales above pectoral-fin base in many species enlarged, forming a flexible tympanum. Gill opening a relatively short vertical to oblique slit in front of pectoral-fin base; mouth small and usually more or less terminal; teeth heavy, 8 in outer series of upper jaw and lower jaw. Three dorsal-fin spines, the second spine more than one half of the length of the first; the first spine capable being locked in an upright position of erection by the second; most dorsal, anal and pectoral-fin rays branched; pelvic fins and spines rudimentary, represented by a series of 4 pairs of enlarged scales encasing the end of pelvis. Lateral line inconspicuous. **Color:** variable and many species having bright color markings



on head and body.

**Remarks:** most species benthic, occurring in coral and rocky reefs from the coastline to a depth of 100 m; some species (e.g. *Canthidermis*) pelagic in open water. Feed on bottom invertebrates, but also zooplankton (e.g. *Melichthys indicus* and *Odonus niger*). High valued as food in many handline fisheries.

**Similar families occurring in the area:** Monacanthidae – two dorsal-fin spines, only the first of which is long and prominent; body more laterally compressed; fewer and less massive teeth in jaws; scales shagreen-like, with individual basal plates small and not readily distinguishable from one another to the unaided eye. (K. Matsuura)

#### *Abalistes stellatus* (Anonymous, 1798)

##### Starry Triggerfish

D III + 26–27; A 24–26; P<sub>1</sub> 14–15 (usually 14). Scales enlarged above pectoral-fin base and just behind gill opening to form a flexible tympanum. A groove in front of eye. Mouth terminal. Caudal peduncle depressed, wider than deep. **Color:** grayish brown to olivaceous on back, with small pale blue or yellow spots dorsally and large yellow spots ventrally; 3 large white blotches on back, disappearing in large specimens. **Size:** 60 cm. **Distribution:** widespread in Indo-West Pacific, from East Africa to northern Australia, north to southern Japan. **Remarks:** occurring on sand, sponge, and weed bottoms to depths of 100 m. Similar to *Abalistes filamentosus* Matsuura & Yoshino, 2004 but distinguished by lacking produced caudal fin rays. Feeds on marine invertebrates. (K. Matsuura)



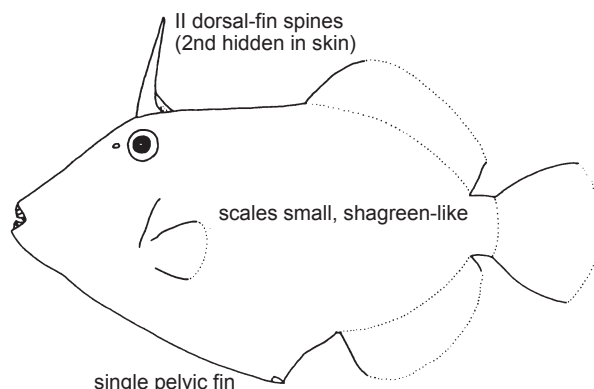
*Abalistes stellatus*, KAUM-I. 23441, 10.3 cm SL  
Gulf of Thailand (SS), 24 Sept. 2009



## MONACANTHIDAE

### Filefishes

Small or medium-sized fishes, usually less than 20 cm (but up to 50 cm for some species of *Aluterus*), with deep, highly compressed body covered by thin but rough or shagreen-like skin with minute scales not individually easily discernible to the unaided eye. Mouth small and usually more or less terminal or slightly supraterminal; teeth only moderately heavy, 6 in an outer series in upper jaw and 6 or fewer in the lower. Gill opening a relatively short, vertical to oblique slit in front of pectoral-fin base. Two (sometimes 1) dorsal-fin spines, second spine not more than 1/3 the length of first; first spine usually capable of being locked in an upright position of erection by the second; dorsal-, anal- and pectoral-fin rays unbranched; pelvic fin and spines rudimentary or absent, represented by a series of 3 or fewer pairs of enlarged scales encasing end of pelvis, or segments of indeterminate number, or entirely absent. Scales



above pectoral-fin base unmodified, not forming a tympanum. Lateral line inconspicuous or only slightly apparent. **Color:** variable, drab brown, gray, or greenish, but often with strikingly marked and vivid patterns.

**Remarks:** found in shallow coral and rocky reefs, seagrass beds, and sandy-muddy bottoms in depths of 10 to over 200 m. Feed on coral polyps, epiphytes attached to seagrass, or

other marine invertebrates. Marketed fresh.

**Similar families occurring in the area:** Balistidae – III spines in first dorsal fin; skin tough but not shagreen-like, individual scales distinct, usually forming prominent, oblique rows. Triacanthidae – VI spines (usually only V spines visible) in first dorsal fin; pair of strong pelvic-fin spines. (K. Matsuura)

#### *Aluterus monoceros* (Linnaeus, 1758)

##### Unicorn Leatherjacket

D II + 45–51; A 47–53; P<sub>1</sub> 14–15. Body elongate, strongly compressed. Dorsal profile of head slightly convex. Gill opening short oblique slit below eye extending antero-ventrally beyond anterior margin of eye. Dorsal spine above eye, very long and fragile; broken frequently in collected specimens. Soft part of dorsal fin opposite to anal fin. Caudal fin shorter than snout. **Color:** body grayish with many irregular dark lines and dots; dorsal-, anal- and pectoral-fin rays yellow; caudal fin dark. **Size:** 76 cm. **Distribution:** circum tropical; in West Pacific known from west coast of peninsular Malaysia eastward to the Solomon Islands,



*Aluterus monoceros*, KAUM-I. 32814, 14.5 cm SL  
Gulf of Thailand (SP), 25 Oct. 2010

northward to the Ryukyu Islands. **Remarks:** forming large schools in coastal waters. (K. Matsuura)

*Anacanthus barbatus*  
Gray, 1830

Bearded Leatherjacket

D II + 48–50; A 58–62; P<sub>1</sub> 8–10; Vertebrae 7 + 23–24 = 30–31. Body extremely elongate, depth at anal-fin origin 8.3–10 in SL. A well-developed barbell on chin, its length longer than pectoral-fin length. First dorsal spine short and feeble, originating over posterior part of eye. Bases of second dorsal and anal fins long. Caudal fin greatly elongate, its length 1.5–2.2 in SL. **Color:** body brown with whitish



*Anacanthus barbatus*, KAUM-I. 47383, 18.3 cm SL  
Gulf of Thailand (SS), 13 June 2012

stripe along dorsal edge of body from mouth to caudal-fin base; dark brown stripe from snout to posterior part of body; ventral half of head and body whitish yellow covered with brown reticulations; chin barbell blackish brown; caudal fin dark brown. **Size:**

maximum 30 cm. **Distribution:** widely distributed in tropical Indo-West Pacific from India eastward to northern Australia. **Remarks:** occurring on muddy bottom at depths 2–20 m.

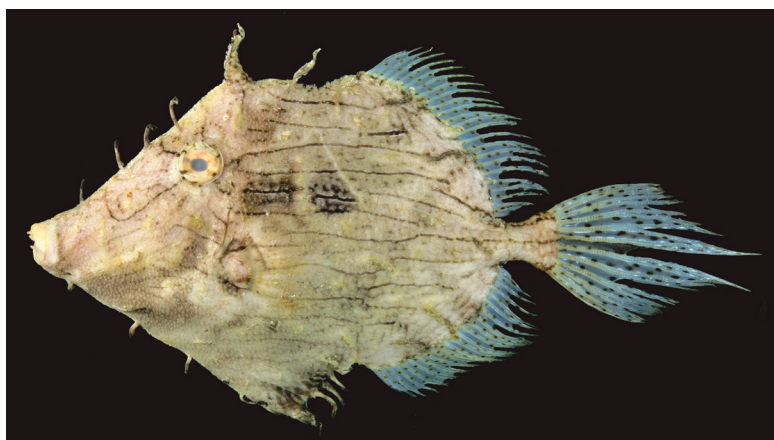
(K. Matsuura)

*Chaetodermis penicilligerus*  
(Cuvier, 1816)

Prickly Leatherjacket

D II + 25–26; A 23–24; P<sub>1</sub> 12–13. Body deep; dorsal profile of head ascending from mouth to dorsal spine. Body covered with many fleshy filaments. Pelvic terminus prominent, composed of 3 segments of encasing scales, movable dorso-ventrally. Scales on body relatively large with a backwardly curved spine. Dorsal spine with many fleshy filaments, located above gill opening. Caudal fin rhomboidal. **Color:** light brown with many longitudinal black lines on side of body; fin rays of dorsal, anal and caudal fins with many black spots. **Size:** 31 cm. **Distribution:** tropical eastern Indian Ocean and West Pacific from west coast of Malaysia eastward to northern Australia, northward to southern Japan. **Remarks:** collected from rocky reefs and sandy-muddy bottom, usually from depths shallower than 200 m; feeds on marine invertebrates.

(K. Matsuura)



*Chaetodermis penicilligerus*, KAUM-I. 33148, 16.9 cm SL  
off Chantha Buri (SP), 22 Nov. 2010

*Monacanthus chinensis*  
(Osbeck, 1765)

Fanbellied Leatherjacket

D II + 28–30; A 27–30; P<sub>1</sub> 12. Body deep; dorsal profile of head concave, ascending from mouth through eye to soft dorsal fin. Pelvic terminus prominent, composed of 3 segments of encasing scales, movable dorso-ventrally; ventral flap very large. Upper caudal fin rays produced into a filament. **Color:** body light brown with many irregular dark brown blotches. **Size:** 38 cm. **Distribution:** west coast of Malay Peninsula and tropical West



*Monacanthus chinensis*, KAUM-I. 32940, 14.1 cm SL  
Ang Sila, 30 Oct. 2010

Pacific from Thailand eastward to New Guinea. **Remarks:** occurring in sea grass bed and rocky reefs in shallow waters. (K. Matsuura)

***Paramonacanthus choircephalus*  
(Bleeker, 1852)**

Pig Faced Leatherjacket

D II + 27–31; A 28–32; P<sub>1</sub> 11–13 (usually 12). Body relatively elongate, strongly compressed. Body depth at anal-fin origin 1.7–3.0 in SL. Dorsal profile of snout slightly convex or straight in male, concave or straight in female and juvenile. Encasing scales of pelvic fin movable. Caudal fin convex; second uppermost ray elongate and filamentous in male. **Color:** body pale yellowish or light brownish with dark brown blotches; dark brown circular to elliptical blotch on midside of body, bisected diagonally by posterior abdominal branch of lateral line; second dorsal, anal and pectoral fins pale; caudal fin pale with two broad, curved, transverse bands. **Size:** maximum 12 cm. **Distribution:** Thailand, Philippines, Indonesia, Australia and New Guinea. **Remarks:** found in shallow waters on flat sandy and silty bottom.

(K. Matsuura)

***Pseudomonacanthus macrurus*  
(Bleeker, 1856)**

Strap-weed Filefish

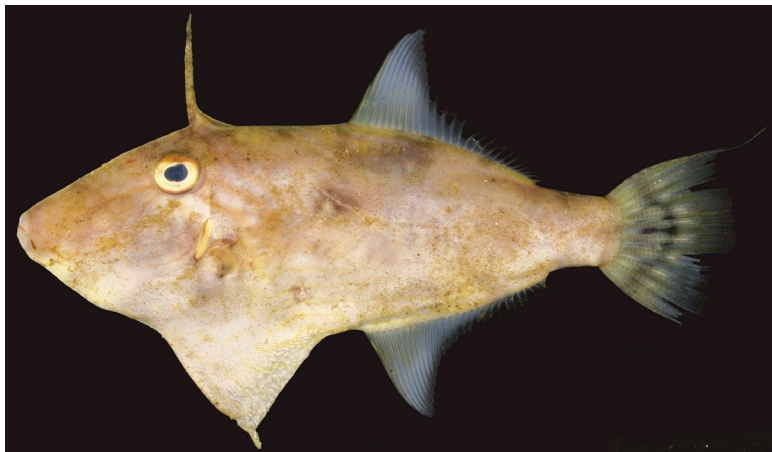
D II + 29–30; A 27–30; P<sub>1</sub> 11–12. Body relatively elongate, strongly compressed. Body depth at anal-fin origin 2.5–2.8 in SL. Dorsal profile of snout slightly concave. Encasing scales of pelvic fin immovable. Caudal fin rounded, its length 3.1 in SL. First dorsal spine originating over posterior half of eye. **Color:** body yellowish brown with many black or dark brown spots; caudal fin with 2 transverse dark brown bands; second dorsal, anal and pectoral fins pale. **Size:** maximum 23 cm. **Distribution:** seas in SE Asia northward to southern Japan. **Remarks:** color highly variable depending on surroundings; occurring on reef flats, lagoons and seagrasses.

(K. Matsuura)

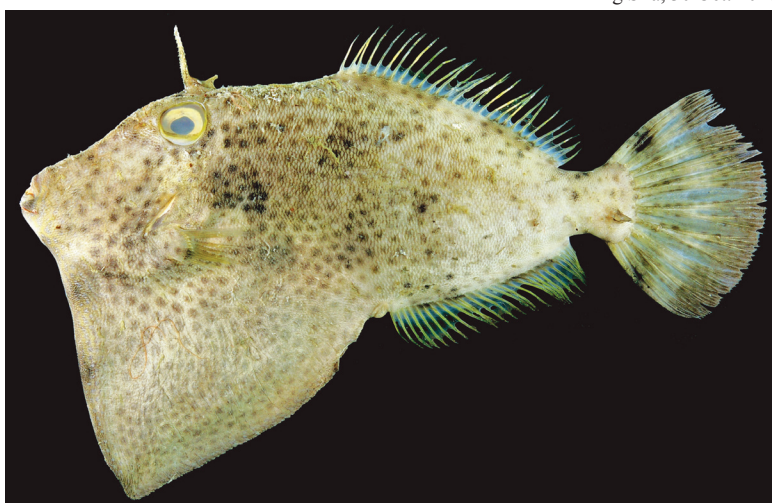
***Thamnaconus hypargyreus*  
(Cope, 1871)**

Lesser-spotted Leatherjacket

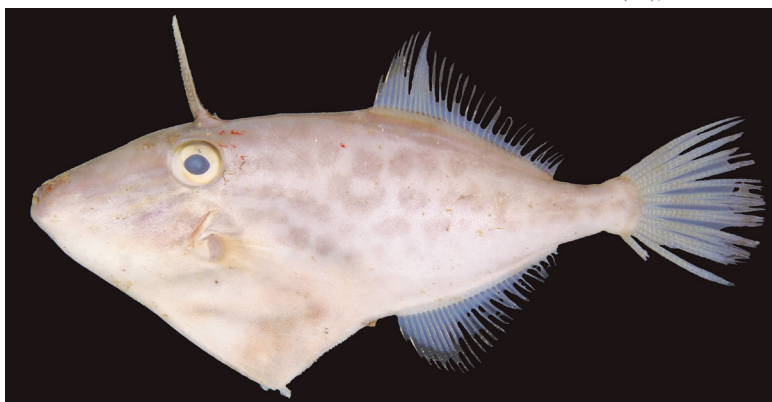
D II + 32–36; A 32–33; P<sub>1</sub> 13–14. Body elliptical, strongly compressed. Dorsal profile of snout slightly convex. Encasing scales of pelvic fin immovable. Caudal fin rounded. First dorsal spine originating over posterior



*Paramonacanthus choircephalus*, KAUM-I. 32935, 8.2 cm SL  
Ang Sila, 30 Oct. 2010



*Pseudomonacanthus macrurus*, KAUM-I. 47471, 17.6 cm SL  
Gulf of Thailand (SS), 20 June 2012



*Thamnaconus hypargyreus*, KAUM-I. 23169, 10.8 cm SL  
Gulf of Thailand (SS), 6 Sept. 2009

half of eye. **Color:** body light brown with many rounded yellowish brown blotches; caudal fin light yellow with dark posterior margin; second dorsal, anal and pectoral fins yellow. **Size:** maximum 25 cm. **Distribution:** warm waters in West Pacific from central Ja-

pan southward through South China Sea to northern Australia. **Remarks:** usually found depths shallower than 90 m but occasionally occurring deeper than 200 m. This species is recorded for the first time from the Gulf of Thailand.

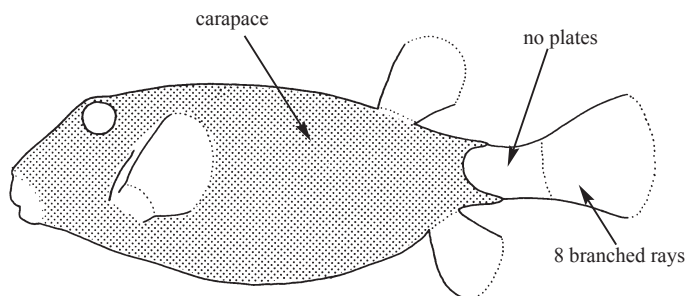
(K. Matsuura)



## OSTRACIIDAE

### Boxfishes

Small to medium-sized fishes, never more than 45 cm, with wide body nearly completely enclosed in a carapace or cuirass formed of enlarged, thickened scale plates, usually hexagonal in shape and firmly sutured to one another (less so on cheek to allow for breathing movements). The carapace has openings for the mouth, eyes, gill slits, and fins, and for the flexible caudal peduncle; it is either triangular (flat on bottom and sharp-crested above) or rectangular in shape, although sometimes relatively pentangular. Mouth small, terminal, with fleshy lips; teeth moderate, conical, usually less than 15 in each jaw. Gill openings relatively short, vertical to oblique slits in front of pectoral-fin bases. Spiny dorsal fin absent; most dorsal-, anal- and pectoral-fin rays branched; pelvic fins absent. Scale-plates often with surface granulations and sometimes prolonged into prominent carapace spines around eye or along the



ventrolateral or dorsal surfaces of the body; scales above pectoral-fin base like the scales of rest of body. Lateral line inconspicuous. **Color:** variable, with general ground colors ranging from gray to bluish and greenish or, to yellowish and brown, usually with darker or lighter lines, bars, spots, or reticulations. **Remarks:** occurring on rocky and coral reefs and over

sand, weed, or sponge-covered bottoms to depths of 100 m. Secreting a substance when distressed that is highly toxic, both to other fishes and themselves in enclosed areas such as aquarium tanks. **Similar families occurring in the area:** No other fishes enclosed in a bony shell.

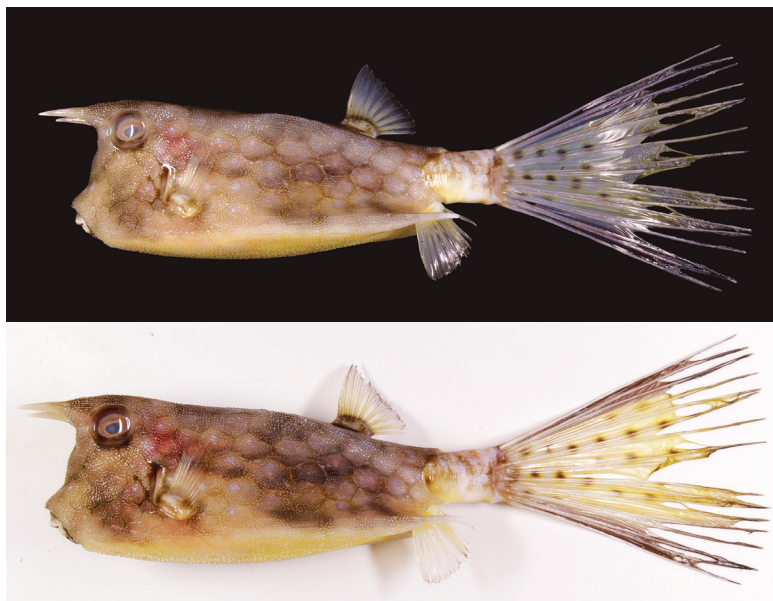
(K. Matsuura)

### *Lactoria cornuta* (Linnaeus, 1758)

#### Longhorn Cowfish

D 8–9; A 9; P<sub>1</sub> 10–11. A pair of sharp, strong horns about twice eye diameter in length projecting anteriorly from front of head. A second pair of horns extending posteriorly from postero-ventral corner of carapace. Caudal fin greatly elongate, one half to two-thirds of carapace length. **Color:** body yellowish brown with light blue spots on sides; dorsal, anal, and pectoral fins pale; caudal fin yellowish with light blue spots. **Size:** maximum 50 cm, commonly to 30 cm. **Distribution:** widely distributed in tropical Indo-West Pacific from East Africa eastward to Marquesas Islands, north to southern Japan. **Remarks:** occurring in weedy areas near rocks or reefs.

(K. Matsuura)



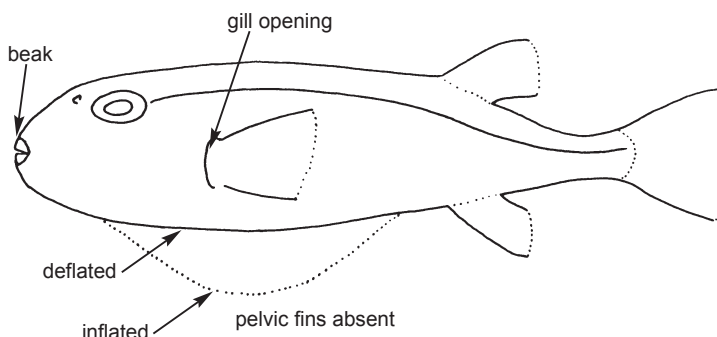
*Lactoria cornuta*, KAUM-I. 23448, 15.6 cm SL  
Gulf of Thailand (SS), 24 Sept. 2009

## TETRAODONTIDAE

### Puffers

Small to moderate-sized fishes, most species less than 30 cm, with a heavy blunt body capable of rapid inflation by intake of water (or air). Head large and blunt; jaws modified to form a beak of 4 heavy, powerful teeth, 2 above and 2 below. Gill openings without distinct opercular cover, appearing as simple slits anterior to the pectoral fin; eyes located high on head. Dorsal and anal fins located far posteriorly bearing no spines, but 7 to 15 soft rays; caudal fin usually truncate to slightly rounded; pelvic fins absent. Typical scales absent, but most species are partially covered with tiny prickles or spinules, and many species have small fleshy tabs or lappets on the dorsal and/or lateral surfaces. **Color:** most species are mottled, variegated, or barred on the upper and lateral surfaces, often with spots of various sizes and colors; ventral surfaces are almost always unpigmented.

**Remarks:** occurring in tropical



and temperate seas, most frequently in shallow inshore waters, sometimes entering brackish and fresh waters, but a few species are pelagic. The viscera, skin, and blood of most species are poisonous; in some species even the flesh is poisonous. Laymen are strongly recommended not to eat puffers, although connoisseurs like to con-

sume puffers in licensed restaurants in some countries (e.g., Japan).

**Similar families occurring in the area:** Diodontidae – head and body covered with strong elongate spines; 1 tooth plate in each jaw.

(K. Matsuura)

#### *Chelonodon patoca* (Hamilton, 1822)

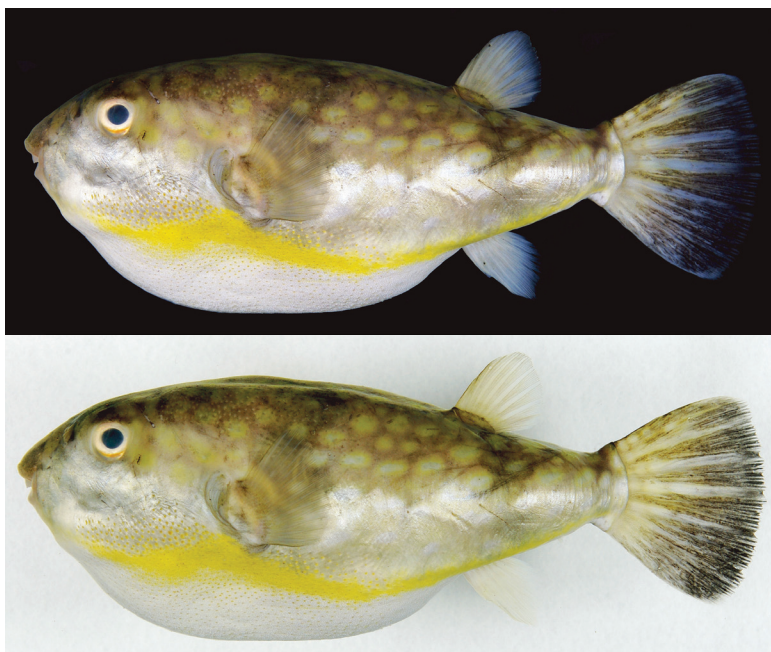
##### Milkspotted Puffer

D 10; A 8; P<sub>1</sub> 15–16. A patch of spinules on back from behind interorbital nearly to dorsal fin and another on throat and abdomen. Nasal organ in the form of a depression with slightly raised margin expanded before and behind into a pair of elongate flaps.

**Color:** greenish-gray to brown on back with large round to ovate white spots, a broad yellow band running from chin to lower caudal-fin base.

**Size:** maximum to 20 cm. **Distribution:** tropical eastern Indian Ocean including India and Sri Lanka and West Pacific from Thailand to French Polynesia, northward to southern Japan and southward to northern Australia; usually found inshore, frequently in brackish waters. **Remarks:** occurring commonly in mangrove areas.

(K. Matsuura)



*Chelonodon patoca*, KAUM-I. 47350, 8.9 cm SL  
Gulf of Thailand (SS), 8 June 2012

***Lagocephalus lunaris***  
**(Bloch & Schneider, 1801)**

Rough Golden Puffer

D 12–13; A 11–12; P<sub>1</sub> 16–17. A patch of spinules on back reaching to dorsal-fin origin; belly covered with spinules. Nasal organ with 2 openings. Caudal fin concave. **Color:** dorsal half of body grayish light brown, side silvery white, and belly white; caudal fin white in the ventral lobe and dark yellow in the dorsal lobe. **Size:** 35 cm. **Distribution:** tropical Indo-West Pacific from East Africa to northern Australia; found recently from southern Japan. **Remarks:** strongly toxic and frequently confused with other species of *Lagocephalus* such as *L. gloveri* Abe & Takita, 1983 and *L. spadiceus* (Richardson, 1845). (K. Matsuura)



*Lagocephalus lunaris*, KAUM-I. 32896, 12.9 cm SL  
Gulf of Thailand (SS), 27 Oct. 2010

***Lagocephalus suezensis***  
**Clark & Gohar, 1953**

Suez Puffer

D 10–12; A 9–10; P<sub>1</sub> 14–16. A patch of spinules on back from between snout to dorsal-fin origin, belly covered with spinules. Nasal organ with 2 openings. Caudal peduncle depressed, wider than deep. **Color:** dorsal half of body light brown with many irregularly shaped brown dots and lines, side silvery white and belly white; dorsal, anal and pectoral fins pale; caudal fin white in the ventral lobe, yellow in the dorsal lobe. **Size:** 20 cm. **Distribution:** topical Indo-West Pacific from Red Sea to northern Australia, northward to southern Japan. **Remarks:** frequently confused with *Lagocephalus sceleratus* (Gmelin, 1789) but distinguished from it by lacking many small black spots on back and by having fewer fin-ray counts (in *L. sceleratus*, dorsal-fin rays 12–13, anal-fin rays 10–12, and pectoral-fin rays 16–17). Probably toxic. (K. Matsuura)



*Lagocephalus suezensis*, KAUM-I. 33204, 6.9 cm SL  
Ang Sila, 26 Nov. 2010



*Takifugu oblongus*, KAUM-I. 33113, 13.2 cm SL  
Gulf of Thailand (SS), 18 Nov. 2010

***Takifugu oblongus***  
**(Bloch, 1786)**

Lattice Blaasop

D 13; A 11; P<sub>1</sub> 16. Body relatively elongate covered with spinules. Nos-

trils with 2 openings. **Color:** body brown dorsally, white ventrally; many transverse white bands on back from snout to caudal peduncle. **Size:** maximum to 40 cm. **Distribution:** tropical

Indo-West Pacific from East Africa eastward to Australia, north to southern East China Sea. **Remarks:** caught by trawl in shallow waters.

(K. Matsuura)

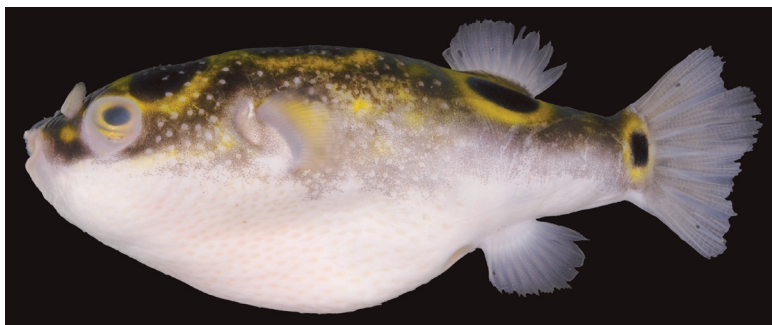


*Tetraodon biocellatus*

Tirant, 1885

Eyespot Pufferfish

D 13–15; A 11–13; P<sub>1</sub> 22. Body relatively elongate, elliptical in cross section, covered by many spinules. **Color:** Dorsal half of body dark brown covered with many small white spots; irregular yellow lines and small blotches on dorsal side of body; ventral half of body white; large black ocellus on dorsal-fin base edged with yellow line; small black ocellus on caudal-fin base edge with yellow line; all fins pale. **Size:** maximum 8 cm. **Distribution:** Borneo, Malaysia and



*Tetraodon biocellatus*, KAUM-I. 23380, 5.0 cm SL  
Bang Pakong, 22 Sept. 2009

Indochina. **Remarks:** The photographed specimen was collected from the Bang Pakong River where many brackish water fishes occurred. (K. Matsuura)

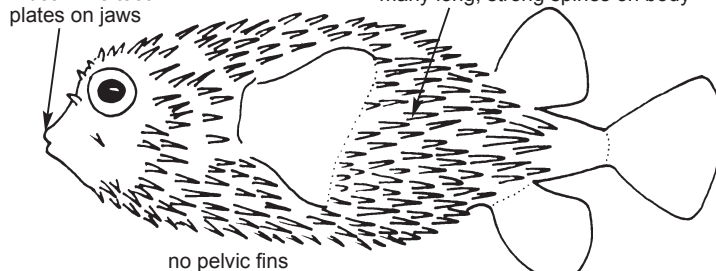
## DIODONTIDAE

## Porcupinefishes

Small or medium-sized fishes (up to 100 cm). Body capable of great inflations, covered with strong spines which may be quite long. Mouth large, wide, and terminal; teeth fused to form a strong, beak-like plate without a median suture dividing left and right halves. Gill opening a relatively small, vertical slit just in front of pectoral-fin base. Dorsal and anal fins without spines, placed far back on body; most fin rays branched; no pelvic fins. Lateral line inconspicuous. No normal scales. **Color:** background color light tan to brown, but frequently gray; usually overlain with dark brown to black spots, bars and/or blotches; belly white,

2 beak-like tooth plates on jaws

many long, strong spines on body



no pelvic fins

frequently with yellow overtone. **Remarks:** found in shallow coral and rocky reefs, seagrass beds, and sandy-muddy bottoms in depths of 10 to over 200 m. Feed on coral polyps, epiphytes attached to seagrass, or other marine invertebrates. Marketed fresh.

**Similar families occurring in the area:** no other families having the following combination of characters: large spines on body, no pelvic fins, inflatable body, teeth fused into a single beak-like plate.

(K. Matsuura)

*Cyclichthys orbicularis*

(Bloch, 1785)

Birdbeak Burrfish

D 11–13; A 10–12; P<sub>1</sub> 18–21. Body rounded with many 3 rooted, non-erectile spines; a small movable spine below and behind corner of mouth. **Color:** head and body brown dorsally, white ventrally; black spots on back and side; all fins pale. **Size:** 16 cm. **Distribution:** tropical Indo-West Pacific from East Africa eastward to New Caledonia, southward to northern Australia, northward to southern Japan. **Remarks:** found in coral and rocky reefs and sandy bottom; usually occur-



*Cyclichthys orbicularis*, KAUM-I. 32983, 10.8 cm SL  
off Chanthaburi (SP), 1 Nov. 2010

ring in depths shallower than 40 m.

(K. Matsuura)

***Diodon holocanthus***  
**Linnaeus, 1758**

Longspined Porcupinefish

D 13–15; A 13–15; P<sub>1</sub> 20–24. Long erectile spines on head and body; 12–16 spines from snout to dorsal-fin base; those on forehead usually longest, none on caudal peduncle. Nasal organ a short hollow tube with 2 openings near tip. **Color:** dorsal side of body light grayish brown with many black spots, white ventrally; wide brown bars or blotches at eye level, mid-back above pectoral- and dorsal-fin bases; fins without spots. **Size:** maximum 38 cm. **Distribution:** circumglobal in tropical and warm temperate seas. **Remarks:** similar to *Di-*



*Diodon holocanthus*, KAUM-I, 32862, 13.3 cm SL  
 Gulf of Thailand (SS), 27 Oct. 2010

*odon liturosus* Shaw, 1804 but distinguished from it by no white edges around brown bars or blotches on body. (K. Matsuura)