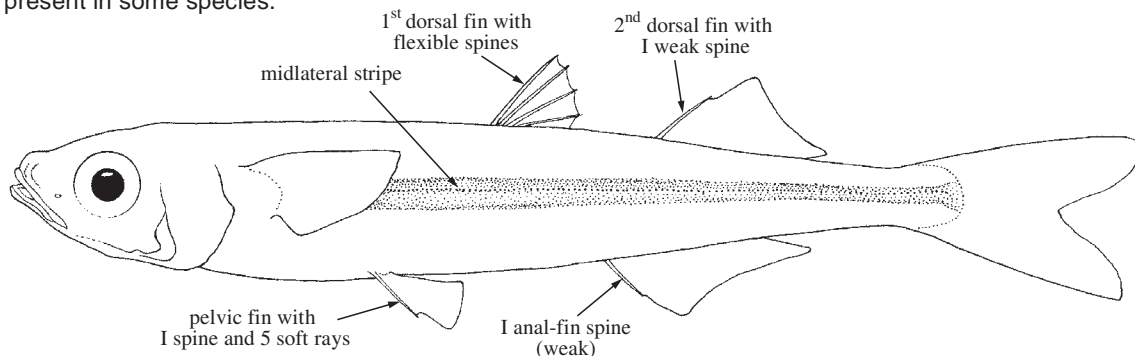


**ATHERINIDAE**

**Silversides (or hardyheads)**

by W. Ivantsoff and L.E.L.M. Crowley

**Diagnostic characters:** Elongate and somewhat compressed silvery fishes (rarely exceeding 12 cm total length). **Mouth generally small, oblique, and terminally placed;** premaxilla with ascending process of variable length, with lateral process present or absent; ramus of dentary bone elevated posteriorly or indistinct from anterior part of lower jaw, protrusibility of jaws variable; teeth present or absent in jaws, palatines, pterygoids (roof of mouth) or on outside of mouth; gill rakers variable, from short and stubby to long and slender, **ranging in number from few to numerous (10 to 26)** on lower arm of first gill arch. **Dorsal fins widely separated,** first with a variable number of small, flexible spines, originating in front of, or behind, vertical through tips of pelvic fins; **second dorsal fin and anal fin with I weak spine,** 1 unbranched soft ray and a variable number of branched soft rays; anal fin always originating slightly in advance of second dorsal fin; **pectoral fins set high on body,** directly behind posterior rim of gill cover, with spine greatly reduced and first ray much thicker than those following. Pelvic fins with I spine and 5 soft rays; caudal fin moderately forked. Anus in front or behind tips of pelvic fins. Lateral line absent. **Scales cycloid** (smooth to touch), moderately large; midlateral scales usually with pore or pit; axillary pelvic scales often present. **Colour:** in life, blue-green, green, or olive on back, translucent with scales delineated by small chromatophores above midlateral band; sides of head and body, as well as abdomen silvery; **midlateral band usually distinct and running from upper margin of pectoral fin to base of caudal fin,** but sometimes blending with silvery abdomen anteriorly; fins clear or dusky; blotch on pectoral fin present in some species.

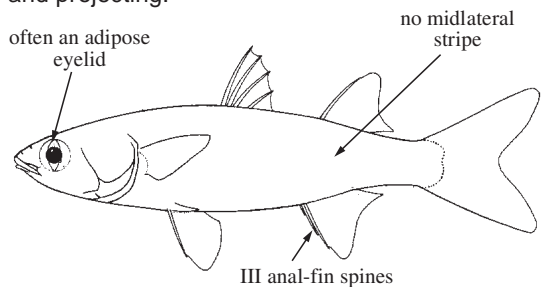


**Habitat, biology, and fisheries:** Mostly close inshore, near the surface, to a depth of about 1 to 2 m. Some species schooling in large numbers; some preferring to stay in small schools. Breeding either annual or opportunistic. Eggs moderately large (up to about 1 mm) with filaments present. Only 2 Old World species (*Atherina breviceps*, *Atherinomorus lacunosus*) are large enough to be valuable as human food; other species are important as forage for commercial fishes and used as bait and dried cat food.

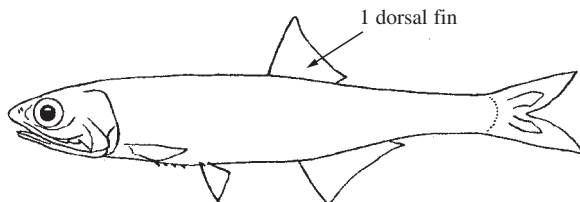
**Similar families occurring in the area**

Mugilidae: head broader and flattened, snout blunt; first dorsal fin with IV slender spines, anal fin with up to III spines (I in Atherinidae); eyes often covered with adipose lids; scales frequently ctenoid (rough to touch) on sides of head; no midlateral band on body.

Engraulidae: a single dorsal fin; no spines in fins; pectoral fins low on body; mouth very large; snout blunt and projecting.



**Mugilidae**



**Engraulidae**

**Identification note**

In the keys and throughout the following descriptions all soft rays, including the first unbranched ray, have been included in the ray count.

**Key to the genera of Atherinidae occurring in the area**

Note: there has been much confusion with atherinid species, possibly due to their small size, with lack of commercial importance leading to insufficient attention to this group. They are small silvery fishes which are superficially similar in size, coloration, and external morphology. Distinct differences, however, do occur in some measurements, counts, and in osteology. Mouthparts are frequently diagnostic of species.

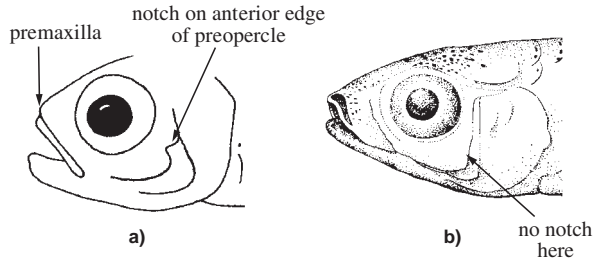
1a. Preopercular notch present (Fig. 1a) . . . . . → 2

1b. Preopercular notch absent (Fig. 1b) . . . . . → 3

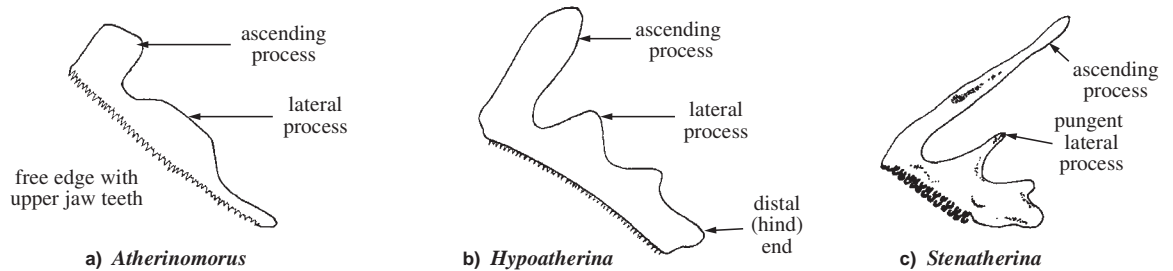
2a. Ascending process of premaxilla short and broad, (Fig. 2a) its length about 1/3 diameter of eye; lateral process of premaxilla broad and flat; mandibular ramus not elevated (Fig. 3a); slight elevation at distal end of dentary present or absent . . . *Atherinomorus*

2b. Ascending process of premaxilla moderately long and narrow, its length about 1/3 to 1/2 diameter of eye; lateral process of premaxilla short and conical (Fig. 2b); lower jaw distinctly elevated posteriorly (Fig. 3b) . . . . . *Hypoatherina*

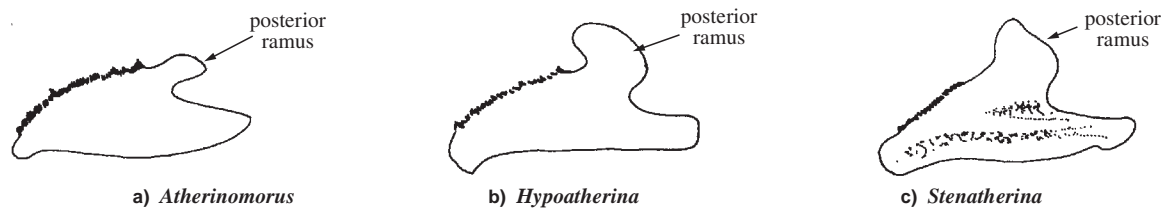
2c. Ascending process of premaxilla long, almost equal to diameter of eye; lateral process narrow and pungent (Fig. 2c); lower jaw elevated; whole of mandibular ramus elevated posteriorly (Fig. 3c) . . . . . *Stenatherina*  
(a single species, *S. panatela*, in the area)



**Fig. 1 lateral view of head**



**Fig. 2 premaxilla**

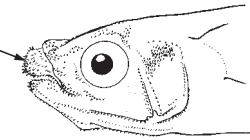


**Fig. 3 dentary**

3a. Shagreen denticles present outside of mouth (Fig. 4a); origin of first dorsal fin always behind vertical through tips of pelvic fins; anal-fin rays always 12 or more; midlateral scale count always 40 or more . . . . . *Atherion*

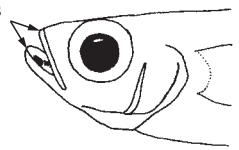
(a single species. *A. elymus*, in the area)

shagreen denticles



a) *Atherion*

no denticles outside mouth



b) *Craterocephalus*

Fig. 4 lateral view of head

3b. Shagreen denticles absent (Fig. 4b); origin of first dorsal fin either in front or behind tips of pelvic fins; anal-fin rays 12 or less, never more; midlateral scale count always less than 40 . . . . . *Craterocephalus*

**Key to the species of *Atherinomorus* occurring in the area**

- 1a. Anus always behind tips of pelvic fins; premaxilla very long, extending well past vertical through anterior border of eye . . . . . *Atherinomorus capricornensis*
- 1b. Anus always at or in front of tips of pelvic fins; premaxilla long, but not usually extending well past vertical through anterior border of eye . . . . . → 2
- 2a. Midlateral scales never more than 39, with means from 34 to 37 . . . . . → 6
- 2b. Midlateral scales may be less than 39, but with mean always greater than 39 . . . . . → 3
- 3a. Midlateral scales 44 to 47; 2 anteriormost predorsal scales on either side of midline and in line with vertical through anterior border of eye . . . . . *Atherinomorus insularum*
- 3b. Midlateral scales 38 to 44; anteriormost predorsal scales single in midline and almost in front of vertical through anterior border of eye . . . . . → 4
- 4a. Midlateral band narrow, restricted to third transverse scale row; origin of first dorsal fin from 1 scale in front to 4 scales behind vertical through tips of pelvic fins . . . *Atherinomorus ogilbyi*
- 4b. Midlateral band not restricted to and always wider than third scale row; origin of first dorsal fin never in front of vertical through tips of pelvic fins. . . . . → 5
- 5a. Midlateral scales 39 to 41; midlateral band wider than single scale but not as wide as in following species; predorsal scales (18 or 19) with well defined point posteriorly; dentary slightly elevated posteriorly with tubercle at distal end; ramus of premaxilla just reaching past vertical through anterior border of eye . . . . . *Atherinomorus cylindricus*
- 5b. Midlateral scales 39 to 44; midlateral band very wide; predorsal scales (17 to 22) rounded posteriorly; dentary without tubercle and not elevated; ramus of premaxilla reaching well past vertical through anterior border of eye . . . . . *Atherinomorus lacunosus*
- 6a. Anal fin with 10 to 12 soft rays; midlateral scales 33 to 37; series of dots on scales extending as lines below midlateral band. . . . . *Atherinomorus lineatus*
- 6b. Anal fin always with 11 or more soft rays; midlateral scales always 34 or more; series of dots not extending as lines below midlateral band. . . . . → 7
- 7a. Gill rakers never less than 21 and up to 25 on lower limb of first gill arch; tubercle-like elevation present or absent at distal end of dentary; dentary may be slightly elevated. . . . . → 8
- 7b. Gill rakers on lower limb of first gill arch 18 to 22 (usually about 20); small tubercle-like elevation often present at distal end of dentary; dentary never elevated. . . . . *Atherinomorus endrachtensis*
- 8a. Lower jaw protruding, forming anteriormost part of head; origin of second dorsal fin only slightly behind vertical through origin of anal fin . . . . . *Atherinomorus balabacensis*
- 8b. Lower jaw not protruding to form anteriormost part of head; origin of second dorsal fin well behind vertical through origin of anal fin . . . . . → 9

- 9a. Position of anus never more than 2 scales in front of tips of pelvic fins; origin of first dorsal fin always at or up to 2 scales in front of vertical through tips of pelvic fins, never behind; predorsal scales 14 to 18; width of midlateral band 2.9 to 3.6 times in body depth . . . . . *Atherinomorus reginae*
- 9b. Position of anus 1.5 to 3 scales in front of tips of pelvic fins; origin of first dorsal fin from 1 scale behind to 1.5 scales in front of vertical through tips of pelvic fins; predorsal scales 17 to 19; width of midlateral band 4.8 to 6.6 times in body depth. . . . *Atherinomorus duodecimalis*

**Key to the species of *Craterocephalus* occurring in the area**


- 1a. Midlateral scales always 33 or more; 12 to 17 gill rakers on lower limb of first gill arch; gill rakers moderately long and slender, about 1/2 diameter of pupil; body depth 4.5 to 7.2 times in standard length, with mean never less than 5.2 . . . . . → 2
- 1b. Midlateral scales always 33 or less; gill rakers never more than 13 on lower limb of first gill arch; gill rakers always less than 1/2 diameter of pupil; body depth never more than 5.4 times in standard length, with mean never more than 4.9 . . . . . → 3
- 2a. Single black spot at base of pectoral fin; gill rakers equal to diameter of pupil; dentary lateral fossa for insertion of labial ligament immediately adjacent to dentary symphysis . . . . . *Craterocephalus mugiloides*
- 2b. No black spot at base of pectoral fin; gill rakers long but slightly less than diameter of pupil; dentary lateral fossa for insertion of labial ligament never adjacent to dentary symphysis . . . . . *Craterocephalus honoriae*
- 3a. Transverse scales 6 to 8; anus always at or behind tips of pelvic fins; midlateral scales 26 to 29 (mean 27); needle-like teeth in 2 rows in upper jaw, in single row in lower jaw . . . . . *Craterocephalus munroi*
- 3b. Transverse scales 5 to 5 1/2; anus always in front of tips of pelvic fins; midlateral scales 29 to 33 (mean 30.8); small teeth in both jaws in 2 rows . . . . . *Craterocephalus capreoli*

**Key to the species of *Hypoatherina* occurring in the area**

- 1a. Body scales distinctly crenulated on posterior edge; body robust, its depth never more than 5.9 times in standard length . . . . . → 2
- 1b. Body scales not crenulated; body slender, its depth never less than 5.5 times in standard length . . . . . → 3
- 2a. Midlateral scales 39 to 45; anal-fin rays 9 to 12 (mean 11.4); body depth 4.8 to 5.9 (mean 5.6) times in standard length . . . . . *Hypoatherina valenciennesi*
- 2b. Midlateral scales 33 to 35; anal-fin rays 8 or 9; body depth 4.1 to 5.2 (mean 4.5) times in standard length . . . . . *Hypoatherina crenolepis*
- 3a. Midlateral band wide, its width 2.3 to 3.2 (mean 2.7) times in body depth; pectoral-fin rays 11 to 14; 15 to 18 (mean 16.7) gill rakers on lower limb of first gill arch; anus always behind tips of pelvic fins . . . . . *Hypoatherina barnesi*
- 3b. Midlateral band narrow, its width 2.8 to 7.1 times in body depth; pectoral-fin rays 14 to 18; 18 to 25 gill rakers on lower limb of first gill arch; anus in front or behind tips of pelvic fins . . . . . → 4
- 4a. Dorsal process of premaxilla long and narrow, 1.3 to 1.8 times in diameter of eye; anal fin with 8 to 11 (mean 9) soft rays; midlateral band very narrow, its width 4 to 7 times in body depth; anus always in front of tips of pelvic fins . . . . . *Hypoatherina ovalaua*
- 4b. Dorsal process of premaxilla short or moderately long, but never less than 1.7 times in diameter of eye; anal fin always with 10 or more soft rays; lateral band moderately wide, its width never more than 5.1 times in body depth; anus in front or behind tips of pelvic fins . . . . . → 5

- 5a. Gill rakers on lower limb of first gill arch 21 to 25 (mean 22.9); predorsal scales 16 to 18; dorsal process of premaxilla of moderate length, 1.7 to 2.5 (mean 2) times in diameter of eye; origin of pelvic fins either behind or in front of tips of pectoral fins . . . . . *Hypoatherina temminckii*
- 5b. Gill rakers on lower limb of first gill arch 18 to 22 (mean 20.3); predorsal scales 17 to 22; dorsal process of premaxilla short, 2.2 to 3.7 (mean 2.9) times in diameter of eye; origin of pelvic fins always in front of tips of pectoral fins . . . . . *Hypoatherina tropicalis*

### List of species occurring in the area

The symbol  is given when species accounts are included.

-  *Atherion elymus* Jordan and Starks, 1901
-  *Atherinomorus balabacensis* (Seale, 1910)
-  *Atherinomorus capricornensis* (Woodland, 1961)
-  *Atherinomorus cylindricus* (Valenciennes, 1835)
-  *Atherinomorus duodecimalis* (Valenciennes, 1835)
-  *Atherinomorus endrachtensis* (Quoy and Gaimard, 1824)
-  *Atherinomorus insularum* (Jordan and Evermann, 1903)
-  *Atherinomorus lacunosus* (Forster and Schneider, 1801)
-  *Atherinomorus lineatus* (Günther, 1872)
-  *Atherinomorus ogilbyi* (Whitley, 1930)
-  *Atherinomorus reginae* (Seale, 1909)
-  *Craterocephalus capreoli* Rendahl, 1922
-  *Craterocephalus honoriae* (Ogilby, 1912)
-  *Craterocephalus mugiloides* (McCulloch, 1913)
-  *Craterocephalus munroi* Crowley and Ivantsoff, 1988
-  *Hypoatherina barnesi* Schultz, 1953
-  *Hypoatherina crenolepis* Schultz, 1953
-  *Hypoatherina ovalaua* (Herre, 1935)
-  *Hypoatherina temminckii* (Bleeker, 1853)
-  *Hypoatherina tropicalis* (Whitley, 1948)
-  *Hypoatherina valenciennei* (Bleeker, 1853)
-  *Stenatherina panatela* (Jordan and Richardson, 1908)

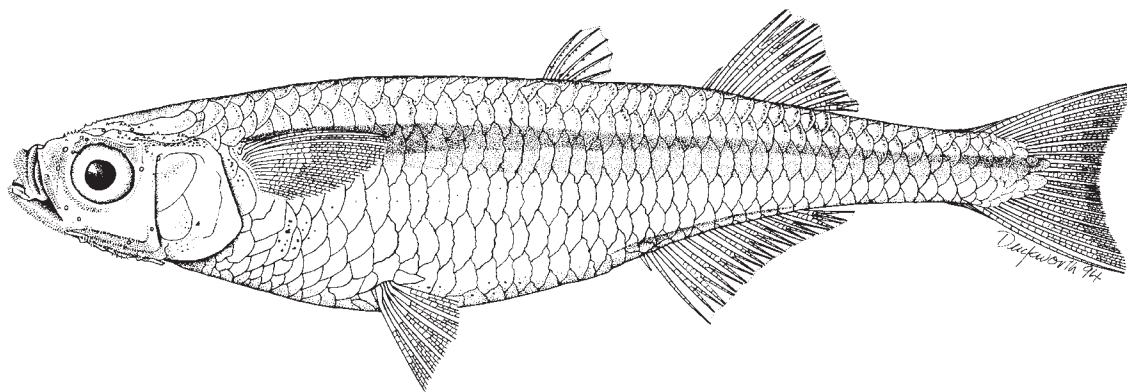
### References

- Gomon, M., C.J.M. Glover, and R. Kuitert. 1994. *Fishes of Australia's south coast*. Adelaide, State Press, 992 p.
- Ivantsoff, W. 1984. Atherinidae. In *FAO species identification sheets for fishery purposes*. Western Indian Ocean (Fishing Area 51), edited by W. Fischer and G. Bianchi. Vol. 1. Rome, FAO (unpaginated).
- Ivantsoff, W. and L.E.L.M. Crowley. 1991. Review of the Australian silverside fishes of the genus *Atherinomorus* (Atherinidae). *Aust. J. Mar. Freshwater Res.*, 46(6):479-505.
- Ivantsoff, W. and L.E.L.M. Crowley. 1992. Redefinition of the freshwater genus *Craterocephalus* (Teleostei: Atherinidae) of Australia and New Guinea, with an analysis of three species. *Ichthyol. Explor., Freshwaters*, 3(3):1-15.

*Atherion elymus* Jordan and Starks, 1901

**Frequent synonyms / misidentifications:** *Atherion elymus freyi* Schultz, 1953; *A. e. asper* Schultz, 1953; *A. e. aphrozoicus* Schultz, 1953 / *Atherion maccullochi* (Ogilby, 1915).

**FAO names:** En - Bearded silverside.

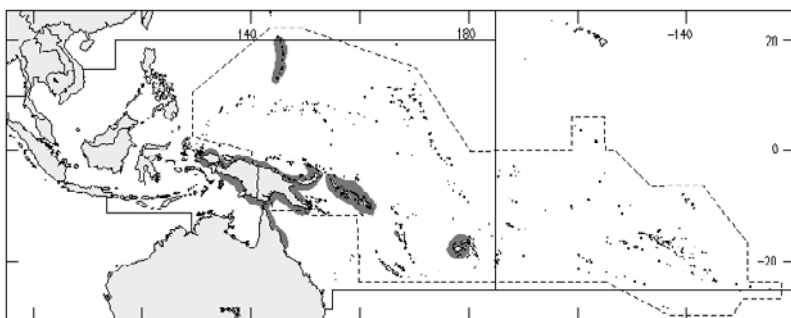


**Diagnostic characters:** Body slender. Mouth smallish, strongly oblique to horizontal, barely protractile, with thin lips. **No notch present on anterior border of preopercle. Shagreen denticles present outside mouth.** Upper jaw well toothed, dentary with patches of small teeth anteriorly. Rest of dentition variable, with teeth present or absent on vomer, rarely present on palatines, but usually found on basihyal and mesopterygoids. Free edge of premaxilla rounded and heavily toothed with notch well behind ascending process, then becoming straight or slightly concave towards corner of mouth. Ascending process of premaxilla blunt, short, and wide; **no lateral processes of premaxilla present. Distal end of maxilla blunt and truncate.** Gill rakers on lower limb of first gill arch 10 to 14, moderately slender and short, less than diameter of pupil. **First dorsal fin with III to V spines**, its origin about 6 to 10 scales behind vertical through tips of pectoral fins. Second dorsal fin with I spine and 8 to 13 soft rays, its origin behind vertical through anal-fin origin. Anal fin with I spine and 13 to 15 soft rays. Pectoral fins with I spine and 11 to 14 soft rays. Body scales moderately large, dorsoventrally elongated with circuli restricted to anterior half of scale; 40 to 44 midlateral scales; 5 or 5 ½ scales in transverse rows along side of body. Predorsal scales 16 to 19; interdorsal scales 5 to 8. Anus well behind tips of pelvic fins. **Colour:** variable in preserved specimens, from light brown with upper half of midlateral band extremely dark; heavy pigmentation around snout, dorsum of head, and lower jaw; cheeks lighter with fewer chromatophores; in live specimens, abdomen, lower half of midlateral band, and opercle silvery; spots on middorsal line large and silvery blue.

**Size:** Maximum length about 5 cm.

**Habitat, biology, and fisheries:** Can be collected in tide pools, surge channels, and coralline ridges of outer reefs. Eggs large. No known commercial value.

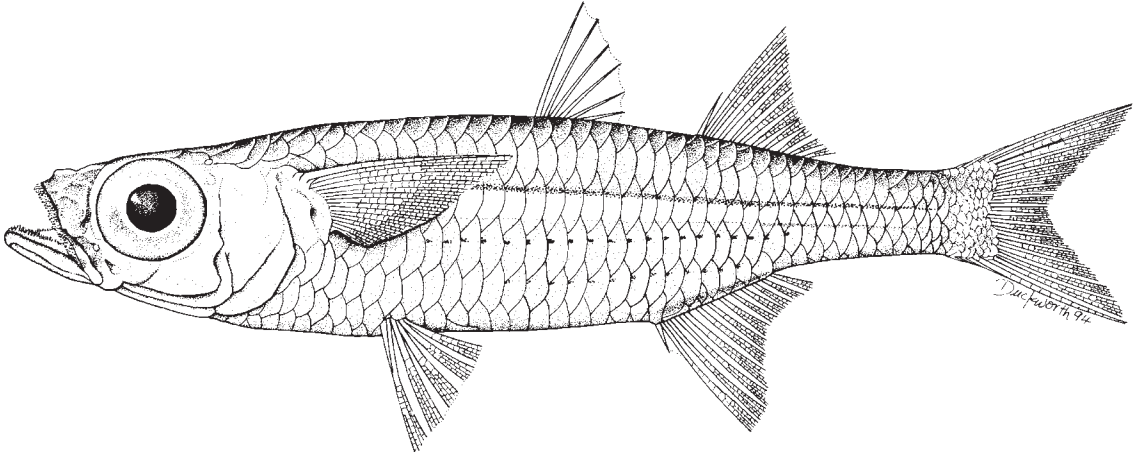
**Distribution:** Wide-ranging in the Pacific, extending from about 18° south along the eastern Australian coast to about 30° north in Japan. Seems to be restricted to the western Pacific Ocean and has been collected close to the islands in Micronesia, Melanesia, Fiji, and New Guinea.



***Atherinomorus balabacensis*** (Seale, 1910)

**Frequent synonyms / misidentifications:** None / *Atherinomorus endrachtensis* (Quoy and Gaimard, 1824); *A. duodecimalis* (Valenciennes, 1835).

**FAO names:** En - Balabac Island silverside.

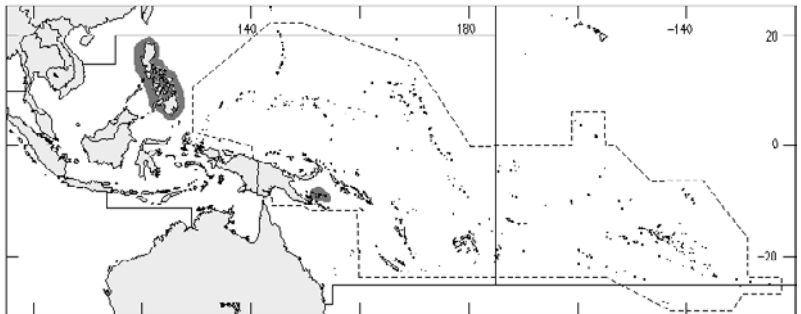


**Diagnostic characters:** Body elongate and deep, slightly compressed. Head conical, with depth greater than width. Mouth large and oblique, just reaching past anterior margin of orbit. **Lower jaw protruding, terminal.** Teeth in jaws small; teeth also present on vomer, mesopterygoid, ectopterygoid, and on back of tongue but absent on palatines. Gill rakers on lower limb of first gill arch 21 to 24, long and slender. First dorsal fin with IV to VI flexible spines, its origin 1 or 2 scales behind tips of pectoral fins. Second dorsal fin with I spine and 8 to 11 soft rays, its origin slightly behind vertical through anal-fin origin. Anal fin with I spine and 12 to 14 soft rays. Pectoral fins with I spine and 14 to 18 soft rays. Body scales large with smooth margins; scales apparently deciduous on head; **36 to 38 midlateral scales**; 5 or 5 ½ scales in transverse rows along side of body. Predorsal scales 16 to 18; interdorsal scales 6 or 7. Anus 1 ½ to 4 scales in front of tips of pelvic fins. **Colour:** preserved specimens uniformly yellow-green with **thin silvery midlateral band**; midlateral band with very fine, blue-black edge above; scales above midlateral band with sprinkling of fine melanophores; row of scales below with small black dot on each, forming continuous line along body; scale rows below with indistinct, incomplete line of dots; dark line along middorsal contour from back of head to base of caudal fin; fins mostly uniformly yellowish with dusky patch at base of pectoral fins; caudal fin with slight dusky tinge; eye with darker markings on top.

**Size:** Maximum length about 6 to 7 cm.

**Habitat, biology, and fisheries:** Generally found close inshore sometimes close to mouth of streams. Nothing is known of the biology of this species. Of no commercial value but may be taken as food by larger commercial species.

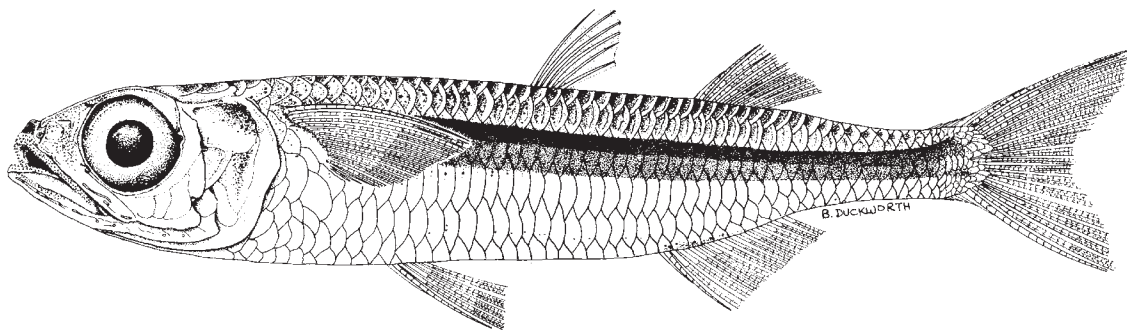
**Distribution:** Philippines (Balabac, Samar, Cebu, Siquijor, Mindanao, Palawan, Culion, Samar Islands); also Trobriand Islands.



*Atherinomorus capricornensis* (Woodland, 1961)

**Frequent synonyms / misidentifications:** *Pranesus capricornensis* Woodland, 1961 / *Pranesus ogilbyi* Whitley, 1930; *P. pinguis* (Lacepède, 1803).

**FAO names:** En - Capricorn silverside.

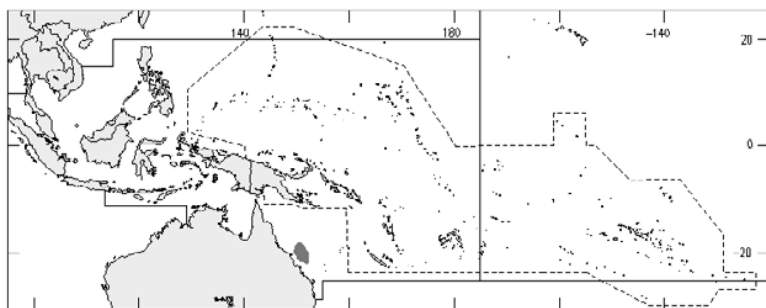


**Diagnostic characters:** Body small and slender, somewhat compressed. Small shagreen denticles present on lips of upper and lower jaws. Teeth in both jaws small, villiform, and in more than 1 row on premaxilla, often extending to outer surface. Teeth on other bones variable in size, **often long and pungent on vomer** and either forming a strong ridge or scattered over mesopterygoid; teeth also present on palatines, ectopterygoids, and tongue; free edge of lower jaw sloping backwards and upwards without distinctly elevating at posterior end. **Ramus of premaxilla long, extending past vertical through anterior border of pupil**, anterior process short, lateral process absent. Gill rakers on lower limb of first gill arch 20 to 24 (usually 22 or 23). First dorsal fin with III to VII spines; second dorsal fin with I spine and 9 or 10 soft rays; anal fin with I spine and 12 to 15 soft rays; pectoral fins with 14 to 17 soft rays. Midlateral scales 41 to 45 (usually 43 to 45); always 5 scales in transverse rows along side of body. Predorsal scales 19 to 22; interdorsal scales 7 to 9. Anus up to 3 scales behind tips of pelvic fins. **Colour:** blue-green, light or dark grey and silvery below; midlateral band wide, covered by third and part of fourth row of midlateral scales; flesh translucent above wide midlateral band, its upper edge iridescent blue; green chromatophores forming middorsal line. Pectoral blotch present or absent; ventral surface often iridescent; snout and opercle silvery; fins dusky but pectoral fins sometimes yellowish; posterior half of scales above midlateral band heavily pigmented, often with C-shaped or diamond-shaped mark on each scale; eyes iridescent blue-green.

**Size:** Maximum length about 12 cm.

**Habitat, biology, and fisheries:** An island species of the Great Barrier Reef. Schools in numbers ranging from several hundred to schools of more than 100 m long and 20 m wide, lying close inshore in depths of about 1 m, generally about from 15 cm below surface to bottom. Feeding occurs mostly at night when schools disperse. Food comprises a variety of planktonic crustaceans. Subject to predation by sharks, tunas, long toms, and amberjacks, also by terns, gannets, seagulls, and herons. May be caught with seines in large numbers but seem to be of little commercial value.

**Distribution:** From the Capricorn Group (e.g. Heron Island (23°27'S, 151°55'E) and some islands closer to the mainland, as far north as Borth Barnard Island, 17°40'S, 146°10'E). It is potentially sympatric with 3 other species of *Atherinomorus*: *A. lacunosus*, *A. endrachtensis* and *A. ogilbyi*. Species of *Hypoatherina* also co-occur.

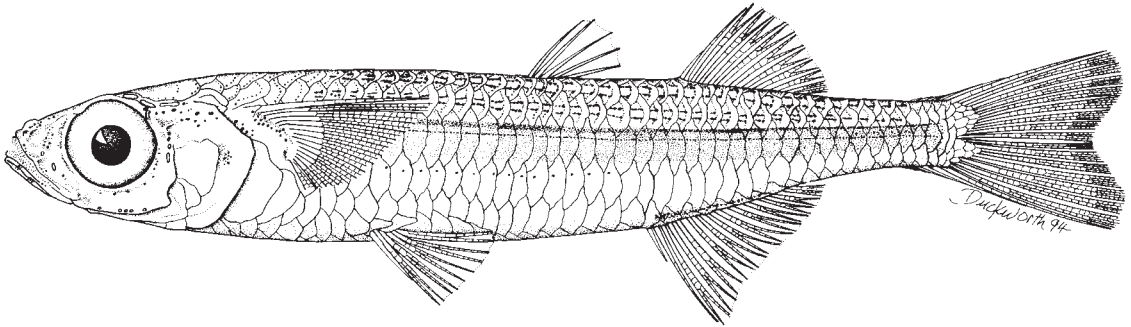




***Atherinomorus cylindricus*** (Valenciennes, 1835)

**Frequent synonyms / misidentifications:** None / *Atherinomorus duodecimalis* (Valenciennes, 1835); *A. endrachtensis* (Quoy and Gaimard, 1824).

**FAO names:** En - Waigeo silverside.

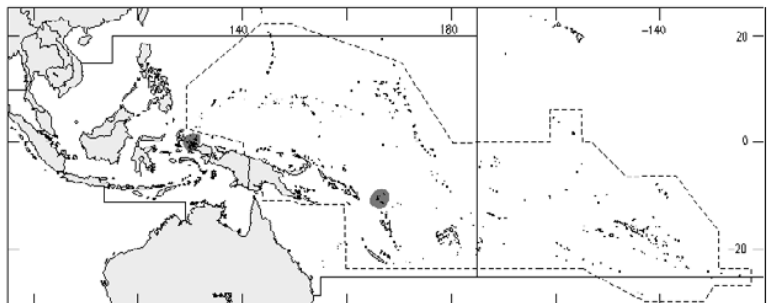


**Diagnostic characters:** Body slender, slightly compressed. Mouth moderately large. Teeth in lower jaw minute, sparse, but evenly spaced; in upper jaw minute and with some fine shagreen denticles on lips. Teeth also present on vomer, tongue, mesopterygoids, and ectopterygoids, but may be difficult to see in last 3. Ascending process of premaxilla short and moderately broad; lateral process broadly rounded. Dentary slightly elevated posteriorly. **Gill rakers** on lower limb of first gill arch **20 to 22**, long and slender, about equal to diameter of pupil, with fine spinules along length. First dorsal fin with V or VI weak spines, its origin 2 to 6 scales behind vertical through tips of pectoral fins. Second dorsal fin with I spine and 10 or 11 soft rays; anal fin with I spine and 12 to 14 soft rays. Pectoral fins with I small spine and 15 or 16 soft rays. Body scales dorsoventrally elongated and rounded posteriorly; **39 to 41 midlateral scales**; 5 scales in transverse rows along side of body. **Predorsal scales 18 or 19, forming well defined point posteriorly; interdorsal scales 6 to 8. Anus 2 to 4 scales in front of pelvic-fin tips.** **Colour:** preserved specimens yellowish with silvery-brown midlateral band; dark, thick reticulate pattern present on dorsal scales; single row of melanophores present (1 on each scale) below midlateral band from origin of pectoral fin as far as vertical through anal-fin origin; eye and opercle silvery; snout and dorsum of head dark.

**Size:** Maximum length about 6.5 cm.

**Habitat, biology, and fisheries:** Like other members of this genus found close inshore around islands. Nothing is known of its biology. Of no commercial value but probably preyed upon by larger species.

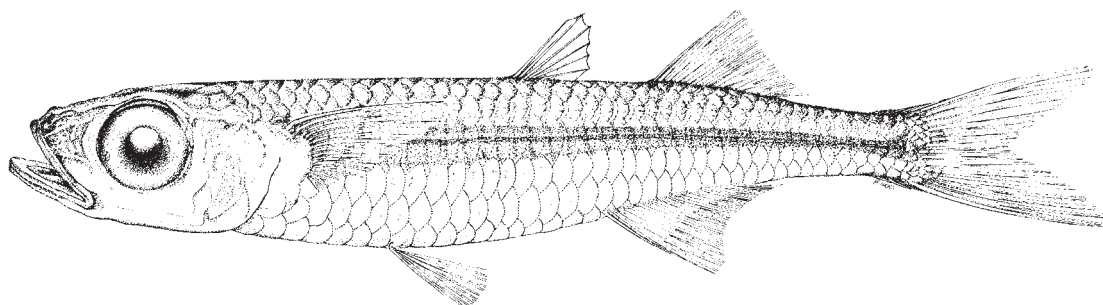
**Distribution:** Waigeo Island; Utupua Island, Santa Cruz Group.



*Atherinomorus duodecimalis* (Valenciennes, 1835)

**Frequent synonyms / misidentifications:** *Pranesus duodecimalis* (Valenciennes, 1835); *Allanetta duodecimalis* (Valenciennes, 1835) / *Atherinomorus endrachtensis* (Quoy and Gaimard, 1824); *A. cylindricus* (Valenciennes, 1835).

**FAO names:** **En** - Tropical silverside; **Fr** - Athérine tropicale; **Sp** - Pejerrey tropical.

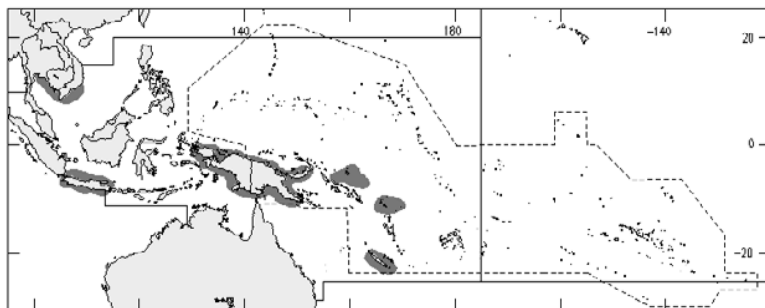


**Diagnostic characters:** Body small, robust, subcylindrical, and laterally compressed. Head and eyes moderately large. Posterior edge of preopercle more or less straight and not projected into a lobe. **Distal end of upper jaw extending slightly backward slightly beyond vertical through anterior border of orbit**, its ascending process moderately short and wide. Outer surface of premaxilla frequently covered with fine denticles scarcely visible to naked eye, but no shagreen denticles elsewhere on head. Teeth in several rows in both jaws. On roof of mouth, teeth usually distinctly visible (but may be weak or lacking) on palatines, ectopterygoids, or mesopterygoids; teeth also present around edge of tongue. **Dentary bone sloping backward and upward, with distinct tubercle-like elevation at its distal end.** Gill rakers moderately long, slightly less than diameter of pupil, 21 to 25 on lower limb of first gill arch. First dorsal fin with IV to VI spines; second dorsal fin with I spine and 9 or 10 soft rays; anal fin with I spine and 12 or 13 soft rays; pectoral fins with I spine and 14 to 17 soft rays. Body scales large; **33 to 38 midlateral scales**; about 5 scales in transverse rows along side of body. Predorsal scales 17 to 19; interdorsal scales 6 or 7. **Anus 2 to 4 (rarely more than 3) scales in front of pelvic-fin tips.** **Colour:** greenish above, whitish below when alive, with silvery midlateral band; preserved specimens brown-green with black midlateral band; edges of scales on back with numerous small chromatophores; rows of spots on third and fourth row of scales extending from about tips of pectoral fins to origin of anal fin or slightly beyond.

**Size:** Maximum length about 8.5 cm.

**Habitat, biology, and fisheries:** Nothing is known of the biology of this species except that it inhabits shallow coastal waters. It can be caught with seines but is probably only of use as a forage fish for larger commercial species. It may also be used as bait.

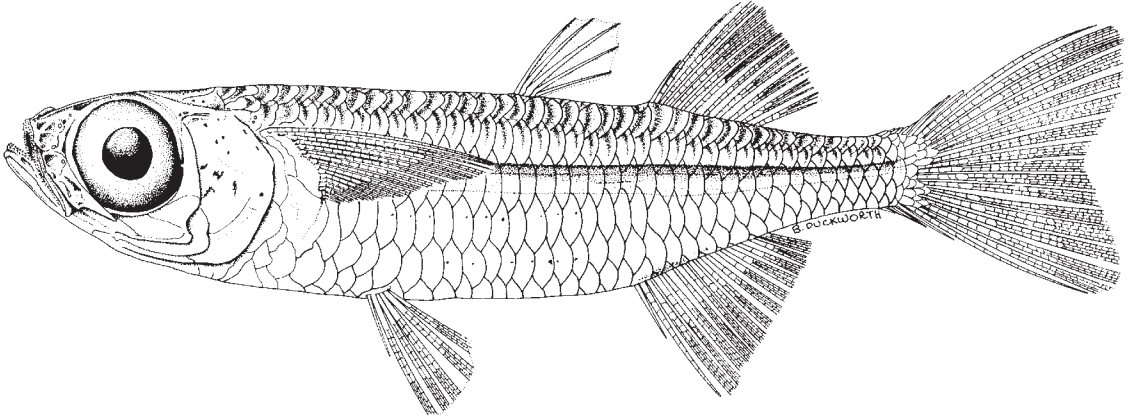
**Distribution:** This species extends well beyond the area into the Indian Ocean. Found off the coast of Java, Thailand, Viet Nam, Papua New Guinea, New Britain, Solomon Islands, New Caledonia, and Utupa Island (Santa Cruz Group).



***Atherinomorus endrachtensis*** (Quoy and Gaimard, 1824)

**Frequent synonyms / misidentifications:** *Pranesus endrachtensis* (Valenciennes, 1835); *Atherinomorus eendrachtensis* (Quoy and Gaimard, 1824) (misspelling) / *Atherinomorus ogilbyi* (Whitley, 1930); *A. duodecimalis* (Valenciennes, 1835); *A. lineatus* (Günther, 1872).

**FAO names:** En - Endracht land silverside.

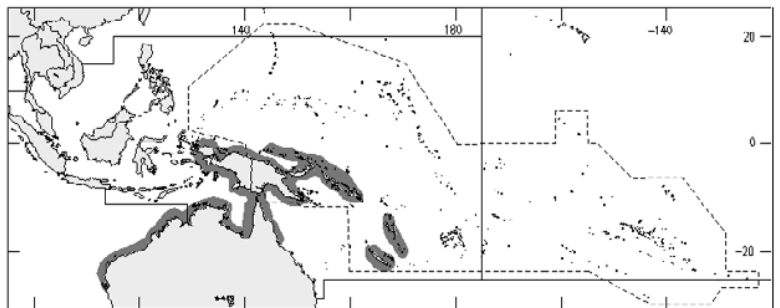


**Diagnostic characters:** Body moderately small, subcylindrical. Mouth barely protractile, large, and moderately oblique. **Teeth in both jaws small**, premaxilla covered with fine shagreen denticles, occasionally also on snout; teeth always present on vomer, but present or absent on palatines and ectopterygoids; **strong ridge of teeth always present on mesopterygoids**. **Free edge of premaxilla moderately short, not extending past vertical through anterior border of pupil**; dorsal process of premaxilla broad, lateral process absent. **Small tubercular elevation often present at distal end of dentary**, but dentaries never elevated. **Gill rakers** on lower limb of first gill arch 18 to 22 (usually about 20), relatively long, **equal to or greater than diameter of pupil**. First dorsal fin with IV to VI weak spines; second dorsal fin with I spine and 8 to 10 soft rays; anal fin with I spine and 11 to 14 soft rays; pectoral fins with 12 to 16 soft rays. **Midlateral scales 34 to 39 (usually 36 to 37)**; 5 or 5 ½ scales in transverse rows along side of body. Predorsal scales 16 to 19; interdorsal scales 5 or 7. Anus 2 to 4 scales in front of pelvic-fin tips, usually close to origin of pelvic fins. **Colour:** live specimens from Western Australia brown-yellow with distinct chromatophores on edges of scales; eye, preopercle, and midlateral band silvery; snout and all fins slightly dusky; pectoral blotch, if present, distinct but not intense. Silvery peritoneum and posterior end of swimbladder visible through translucent flesh; preserved specimens light yellow, yellow-brown, or yellow-green; upper half of body darker; midlateral silvery black band edged by narrow black line above; blotch on pectoral fins present or absent.

**Size:** Maximum standard length about 8.4 cm.

**Habitat, biology, and fisheries:** Inhabits shallow coastal waters. Nothing is known of the biology of this species other than that it schools together in shallow waters with *Atherinomorus lacunosus*, *A. ogilbyi*, *Craterocephalus mugiloides*, and *Hypoatherina temminckii* in coastal areas of northern Australia. Potentially sympatric with *Atherinomorus duodecimalis* in New Guinea, New Britain, and the Solomon Islands. May be collected with seines but has no commercial value.

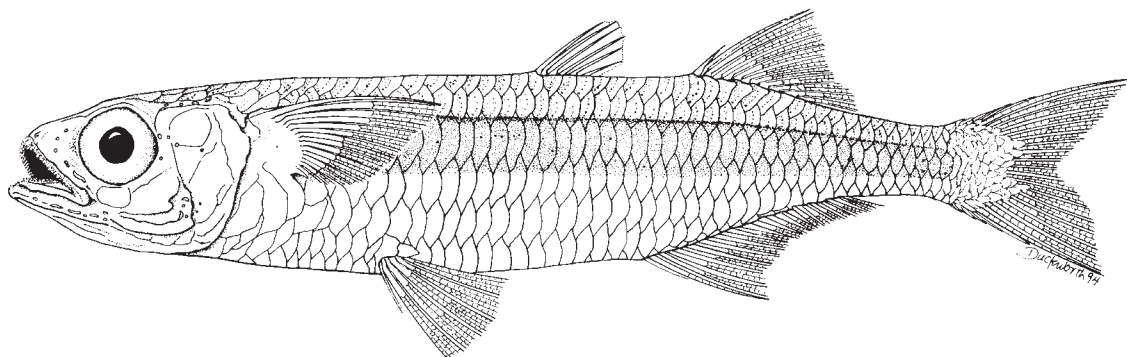
**Distribution:** Northern waters of Australia; Vanuatu, Papua New Guinea, Admiralty Islands, New Britain, Solomon Islands, and New Caledonia. Sold in small quantities at some markets in the Philippines.



*Atherinomorus insularum* (Jordan and Evermann, 1903)

**Frequent synonyms / misidentifications:** *Atherina insularum* (Jordan and Evermann, 1903) / *Atherinomorus lacunosus* (Forster and Schneider, 1801); *Pranesus pinguis* (Lacepède, 1803).

**FAO names:** En - Hawaiian silverside.

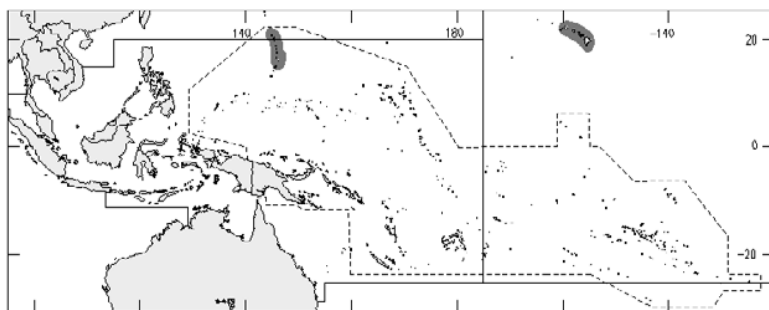


**Diagnostic characters:** **Body slender, moderately compressed.** Head and eyes not particularly large (when compared with *Atherinomorus duodecimalis*). Outer surface of mouth frequently covered by fine shagreen denticles; labial ligament long and fleshy, reaching to 2/3 way along lower jaw. Teeth in jaws small, needle-like, and usually in single row. Teeth also present on posterior part but absent from front of basihyal; single ridge of teeth on mesopterygoid and ectopterygoid; **teeth on vomer very small and difficult to see.** Free edge of premaxilla reaching past vertical through anterior border of orbit, its ascending process short and blunt and lateral process broadly rounded. Dentary gently sloping upward and backward. **Gill rakers** with spinules, slender and **longer than diameter of pupil**, 19 to 23 on lower limb of first gill arch. First dorsal fin with V to VII weak spines, its origin 4 to 7 scales behind tips of pectoral fins. Second dorsal fin with I spine and 10 or 11 soft rays, its origin behind vertical through origin of anal fin. Anal fin with I spine and 15 to 18 soft rays. Pectoral fins with I small spine and 14 to 17 soft rays. Midlateral body scales 44 to 47, moderately large, dorsoventrally elongated; 5 or 5 ½ scales in transverse rows along side of body. **Predorsal scales 20 to 23**; 2 predorsal scales on dorsum of head, on either side of centre line and almost in front of vertical through orbit; interdorsal scales 6 to 9. Anus at, or only slightly (1 scale) in front of tips of pelvic fins. **Colour:** preserved specimens yellowish with fine blue-black line above diffuse but broad silvery midlateral band; opercle silvery; eye mostly silvery with a dark section at the top; dorsum of head dark; snout dark above lips; scales above midlateral band outlined with melanophores forming a reticulate pattern; fins clear.

**Size:** Maximum length about 9 cm.

**Habitat, biology, and fisheries:** The species lays eggs of about 1 to 1.5 mm diameter which have long tendrils attached to chorion. Larvae hatch at 4 mm. Fully mature at about 15 mm. This silverside swims in small schools during daylight hours close to the shore line and disperses at night spreading over the reef. A nocturnal plankton eater, its gut content containing mostly crustaceans and foraminiferans. Like other species of this family, it is of no commercial value but may be taken by larger species as food.

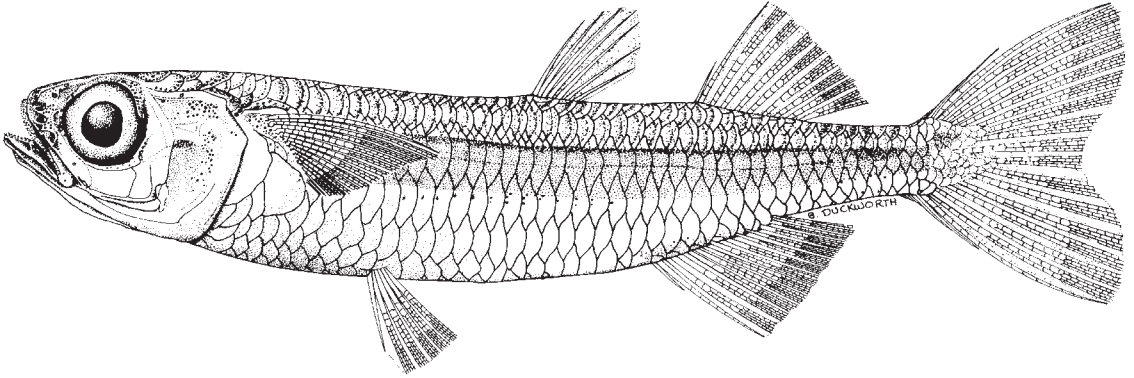
**Distribution:** Found in the waters of Hawaii. A population identified as its subspecies, occurs off the south coast of Molokai Island, 22°N 3°08'E. Saipan, Mariana Islands.



*Atherinomorus lacunosus* (Forster and Schneider 1801)

**Frequent synonyms / misidentifications:** *Pranesus pinguis* (Lacepède, 1803); *P. vaigiensis* (Quoy and Gaimard, 1825); *P. maculatus* Taylor, 1964); *Atherina forskalii* (Rüppell, 1838); *A. morrissi* Jordan and Starks, 1906 / *Atherinomorus ogilbyi* (Whitley, 1930), *A. capricornensis* (Woodland, 1961).

**FAO names:** **En** - Hardyhead silverside; **Fr** - Atherin tête; **Sp** - Pejerrey cabezón.

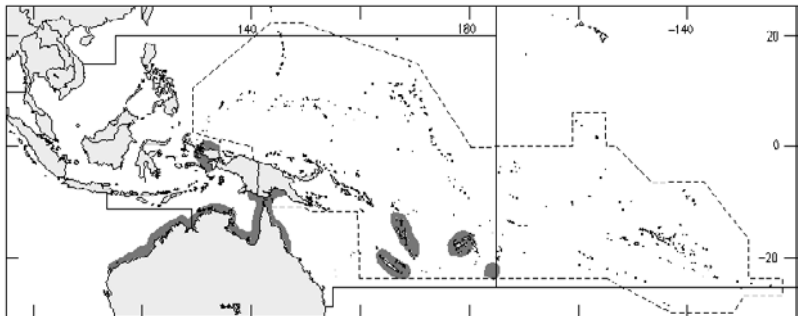


**Diagnostic characters:** Body subcylindrical, laterally compressed. Head and eyes moderately large. **Distal end of upper jaw extending backward to vertical through anterior border of pupil**, its ascending process short and blunt, lateral process low and broad. Outer surface of premaxilla frequently covered with fine denticles, scarcely visible to naked eye; no shagreen denticles elsewhere on head. Teeth in jaws small, villiform, usually in more than 1 row on premaxilla. Teeth also present on roof of mouth (palatines, vomer, sometimes also ectopterygoids). **Free edge of dentary bone almost flat, with no posterior elevation.** Gill rakers long and slender, equal to or longer than diameter of pupil, 18 to 25 on lower limb of first gill arch. First dorsal fin with IV to VII spines; second dorsal fin with I spine and 8 to 11 soft rays; anal fin with I spine and 12 to 17 soft rays; pectoral fins with 14 to 18 soft rays. Body scales large; **39 to 44 midlateral scales**; 5 or 5 ½ transverse scales rows along side of body. Predorsal scales 17 to 22; interdorsal scales 6 to 9. Anus at, or slightly in front of, tips of pelvic fins. **Colour:** blue-green and translucent with silvery parts of abdomen and head frequently iridescent; midlateral band wider than 1 scale row along side, silvery and often merging with silvery abdomen on anterior part of body; opercle and iris silvery; upper surface of head heavily pigmented; scales on back usually outlined with small chromatophores; fins clear to dusky, pectoral fins frequently with blackish blotch.

**Size:** Maximum length about 11 cm.

**Habitat, biology, and fisheries:** During the day, this species aggregates in large, relatively inactive schools, close inshore. The fish disperse over reefs at sunset, keeping about 2 to 4 m apart. Feeding occurs at night and food includes planktonic eggs, crustaceans, foraminiferans, amphipods, ostracods, calenoid copepods, and caridean shrimp larvae (most plankton less than 0.5 mm in size). Small fish such as *Clupea* and *Sardinella* species are also taken as food. The schools reform in the early morning and move back closer to shore. Small individuals, less than 3.5 cm standard length, form small schools also relatively close to the shore and feed actively during daylight hours. *Atherinomorus lacunosus* is one of the largest and most robust of silversides occurring in the area. It is known to be sold at fish markets in various parts of the world.

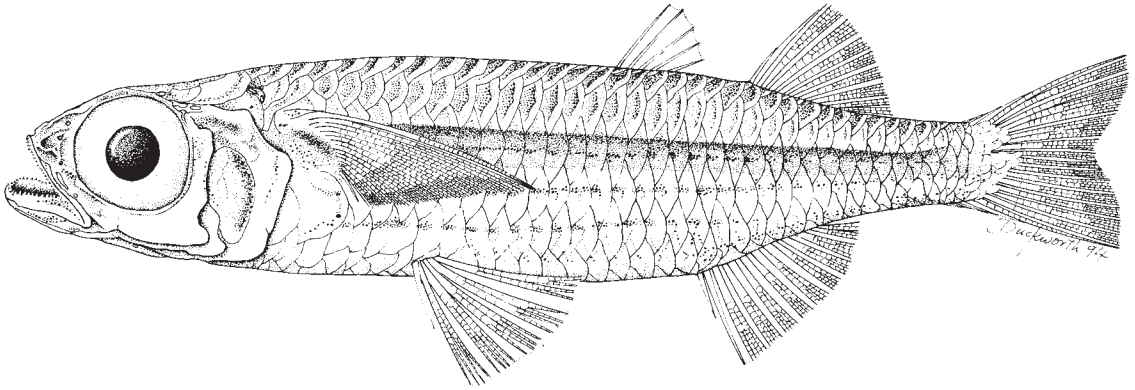
**Distribution:** Ambon Island (Indonesia), Waigeo Island (West Irian), New Guinea, Vanuatu; northern Australia, Fiji, New Caledonia, and Tonga. Outside the area also found in the eastern Mediterranean, Indian Ocean, and in the Pacific as far north as Japan.



*Atherinomorus lineatus* (Günther, 1872)

**Frequent synonyms / misidentifications:** *Atherina lineata* Günther, 1872 / *Atherinomorus endrachtensis* (Quoy and Gaimard, 1824).

**FAO names:** En - Lined silverside.



**Diagnostic characters:** Body slender. **Eyes large, their diameter equal to interorbital space.** Snout very short. Lips thin, fusing at junction of premaxilla and maxilla. Teeth in upper and lower jaws in several rows; shagreen denticles present on lips; teeth also present on palatines, vomer, and mesopterygoids. Premaxilla extending just past vertical through anterior margin of orbit; ascending process of premaxilla blunt, short, and broad based. Gill rakers on lower limb of first gill arch 20 to 23. First dorsal fin with IV or V weak spines, its origin at, or up to 2 ½ scales behind, vertical through tips of pelvic fins. Second dorsal fin with I spine and 7 to 9 soft rays. Anal fin with I spine and 10 to 12 soft rays. Pectoral fins long and pointed. Body scales dorsoventrally elongated; **33 to 37 midlateral scales**; 5 scales in transverse rows along side of body. Predorsal scales 17 to 19; interdorsal scales 6 or 7. Anus 2 ½ to 5 scales in front of pelvic-fin tips. **Colour:** in preserved specimens, only narrow **upper edge of midlateral band visible as lighter yellow-gold or black; series of black dots on scale rows extending as lines** below midlateral band; eye silvery black.

**Size:** Maximum length about 7.5 cm.

**Habitat, biology, and fisheries:** Appears to live in shallow waters in cays or close to shore. Nothing is known of the biology. The species is not well known and is unlikely to have any commercial value.

**Distribution:** Amboyna Cay (Spratly Islands), Halmahera Island (Indonesia), and Cebu (Philippines).

