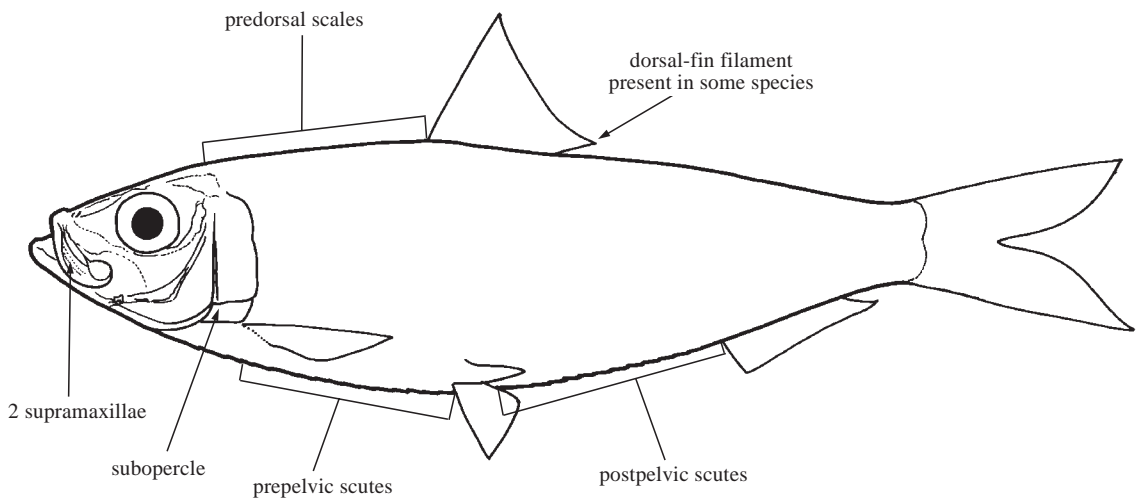


CLUPEIDAE

Herrings (also, sardines, shads, sprats, pilchards, and menhadens)

by T.A. Munroe, T. Wongratana, and M.S. Nizinski

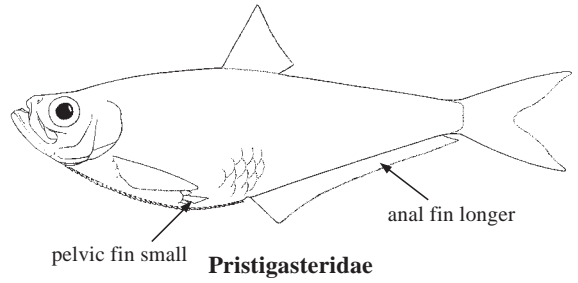
Diagnostic characters: Typically fusiform fishes, oval in cross-section, and sometimes strongly compressed; **with a complete series of scutes along the abdomen (pelvic scute always present); with terminal mouth, usually 2 supramaxillae, and small or minute jaw teeth. No spiny rays in dorsal fin; a single dorsal fin**, which is short and near midpoint of body. Pectoral fins set low on body; pelvic fins just anterior to, below, or just posterior to dorsal-fin base; **anal fin short (usually less than 28 soft rays) with origin well posterior to vertical through base of posteriormost dorsal-fin ray**; caudal fin always deeply forked. **Scales cycloid**, adherent and of moderate size (about 35 to 68 in lateral series). Eyelids with vertical opening in middle (but completely covering eyes only in *Etrumeus*). **No lateral line. Scales without posterior striations.** There is great variation in body shape and depth (round bodied to strongly compressed and deep), scutes (some or all absent along abdomen, but a few or a complete series of predorsal scutes occasionally present), mouth shape (lower jaw prominent to mouth fully inferior in the gizzard shads), supramaxillae (one or both absent), teeth (absent in some, canines in others), scales (deciduous in some, minute in others). **Colour:** typically blue-green on back and silvery on flanks; with variable darker markings including spot behind gill cover, spots along flanks, spot at dorsal-fin origin, and dark pigmentation on part of dorsal, pectoral, anal, and caudal fins.



Habitat, biology, and fisheries: Clupeids are typically marine coastal and schooling fishes that feed on small planktonic animals (mainly crustaceans). They form large schools and scatter large numbers of pelagic eggs that hatch planktonic larvae. There is great range in the biology and ecology of clupeids. Some enter fresh water to feed, some are anadromous, and some live permanently in fresh water, some are partial or full-time filter-feeders, some are predators on fishes (and probably form only loose and small schools as adults), and some produce only 200 eggs or less (pygmy species) or attach their eggs to the substrate. It is mainly the cool water genera that dominate the clupeid catches. Individually, few warm-water species dominate clupeid catches (exceptions are *Sardinella lemuru* and *S. longiceps*), but multispecies clupeid fisheries may account for as much as 1/3 of the total fish catch in some areas. Found in all seas from 70°N to about 60°S. Usually adults range in size from 10 to 20 cm in standard length. However, great variation is found in size, from the shad *Tenuulosa ilisha* (to about 60 cm) to riverine pygmy species (*Sierrathrissa leonensis* and *Thrattidion noctivagus*), which may be mature at less than 2 cm.

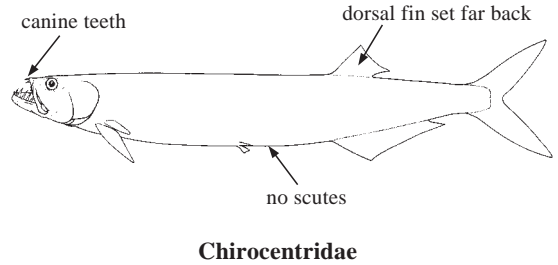
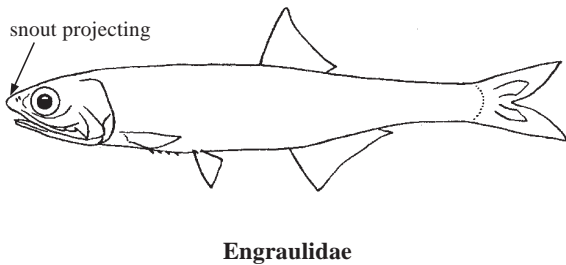
Similar families occurring in the area

Pristigasteridae: snout not pig-like and projecting, lower jaw not underslung, lower jaw projecting, mouth directed more or less upward, articulation of lower jaw always anterior to vertical through middle of eye; scales without posterior striations; eyelids with broad vertical opening in middle; usually with a complete series of scutes along the abdomen; pelvic fins small, inserting more or less anterior to the vertical through the dorsal-fin origin; anal fin with at least 34 fin rays.



Engraulidae: articulation of lower jaw well behind eye, lower jaw usually slender; snout pig-like and projecting, lower jaw underslung; adipose tissue covering eyes completely; scales with posterior striae or striations.

Chirocentridae: no scutes along the abdomen (even pelvic scute absent); 2 fang-like canine teeth in upper jaw, pointing forward; body highly compressed, very elongate; adipose tissue covering eyes completely; scales without striations, usually lost upon capture.



Identification note

All fin rays are soft, segmented and either branched or unbranched at the tips. In the dorsal and anal fins, the first 2, 3, or 4 fin rays are unbranched (the first very small and easily missed), the remainder branched (the last sometimes branched near its base, thus appearing as 2, but counted as 1). The first pectoral- and pelvic-fin rays are also unbranched. Unbranched fin rays are indicated in lower case roman numerals. Gill raker counts all refer to the first gill arch.

Key to the subfamilies of Clupeidae occurring in the area

- 1a. Pelvic scute W-shaped; no other scutes along abdomen (Fig. 1a) **Dussumieriinae**
- 1b. Pelvic scute with ascending arms; scutes usually present before and behind pelvic fins (Fig. 1b) → 2
- 2a. Upper jaw rounded when seen from front (Fig. 2a) → 3
- 2b. Upper jaw with a distinct median notch or cleft when seen from front (Fig. 2b) → 4

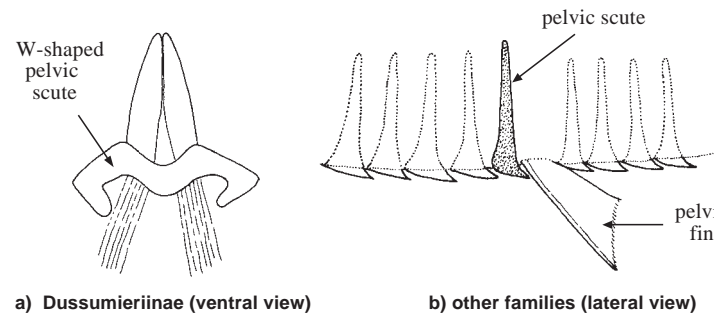


Fig. 1 pelvic scute

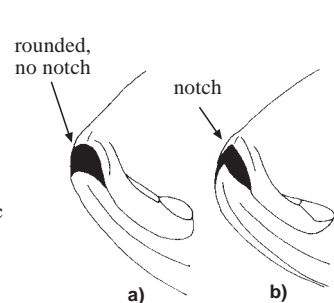


Fig. 2 antermost part of head (lateral view)

- 3a. Anterior as well as posterior supramaxilla present (Fig. 3a) **Clupeinae**
- 3b. No anterior supramaxillae (Fig. 3b) **Pellonulinae**
- 4a. Lower jaw normal, mouth terminal (Fig. 4a); posteriormost dorsal-fin ray normal **Alosinae**
- 4b. Lower jaw flared outward, mouth usually inferior (Fig. 4b); posteriormost dorsal-fin ray filamentous in many species **Dorosomatinae**

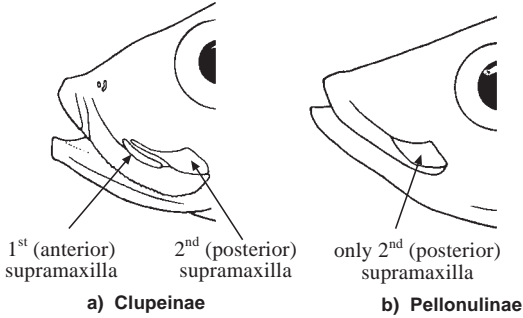


Fig. 3 anterior part of head

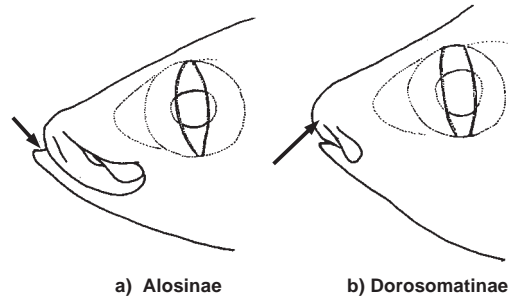


Fig. 4 anterior part of head

Key to the genera and species of Dussumieriinae occurring in the area

- 1a. Branchiostegal rays numerous (11 to 18) (Fig. 5); premaxillae rectangular (Fig. 6a) (*Dussumieria*) → 2
- 1b. Branchiostegal rays few (6 to 8); premaxillae triangular (Fig. 6b) (*Spratelloides*) → 3
- 2a. Body deeper (usually 22 to 29% standard length); lower gill rakers 19 to 26; 12 to 15 branchiostegal rays; posterior part of scales with numerous tiny radiating striae (Fig. 7) *Dussumieria acuta*
- 2b. Body relatively slender (usually 16 to 22% standard length); lower gill rakers 21 to 32; branchiostegal rays 13 to 18; no striae on posterior part of scales *Dussumieria elopsoides*

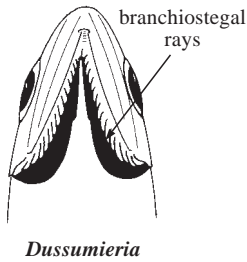


Fig. 5 ventral view of head

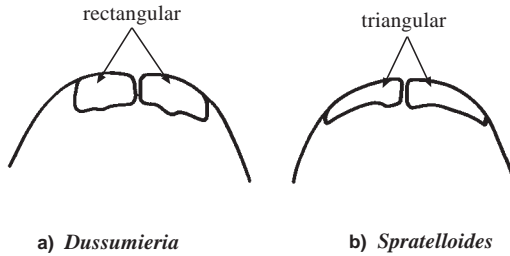


Fig. 6 premaxillae (seen from above)

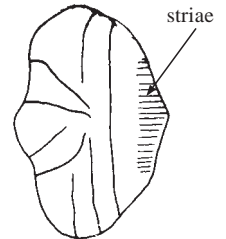


Fig. 7 scale

- 3a. No bright silvery stripe along flanks; maxilla toothless; second supramaxilla symmetrically-shaped (Fig. 8a); vertical striae of scales meeting at centre of scales (Fig. 8b) → 4
- 3b. Flanks with bright silvery stripe; maxilla with fine teeth; second supramaxilla asymmetrical in shape (lower part larger than upper part; Fig. 9a); vertical striae of scales not meeting at scale centre (Fig. 9b) → 5

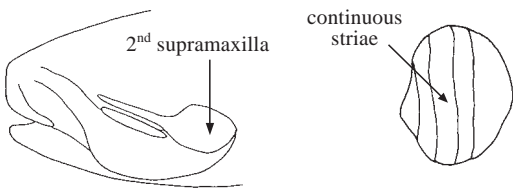


Fig. 8

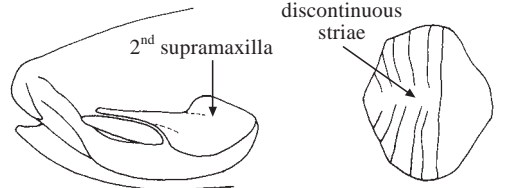


Fig. 9

- 4a. Predorsal scales 8 to 13; 35 to 41 scales in lateral series; posterior margin of scales smooth; 2 prominent streaks of pigment on caudal-fin base *Spratelloides delicatulus*
- 4b. Predorsal scales 13 to 16; 42 to 46 scales in lateral series; posterior margin of scales toothed; no prominent streaks of pigment on caudal-fin base *Spratelloides robustus*
(western and southeastern Australia; not yet recorded from the area)
- 5a. Lateral band of pigment extending completely along entire side of body; 42 to 48 scales in lateral series *Spratelloides gracilis*
- 5b. Lateral band of pigment incomplete, fading anteriorly and usually reaching only to point about equal with posterior tips of pectoral-fin rays; 39 to 43 scales in lateral series *Spratelloides lewisi*

Key to the species of Clupeinae occurring in the area

- 1a. Opercle with bony radiating striae (Fig. 10); 2 posteriormost anal-fin rays elongated; gill rakers absent on posterior face of third epibranchial; fleshy "rakers" on upper edge of ceratohyal *Sardinops neopilchardus*
(eastern Australia; not yet recorded from the area)
- 1b. Opercle smooth; gill rakers usually present on posterior face of third epibranchial; upper edge of ceratohyal smooth → 2
- 2a. Posterior border of gill opening evenly rounded, without fleshy outgrowths; pelvic-fin rays 7 (*Escualosa*) → 3
- 2b. Posterior border of gill opening with 2 distinct fleshy outgrowths (Fig. 11); pelvic-fin rays 8 or 9 → 4

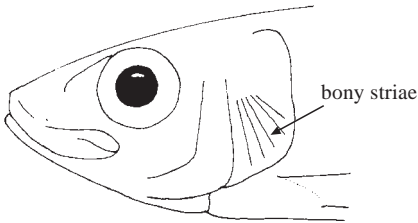


Fig. 10 *Sardinops neopilchardus*

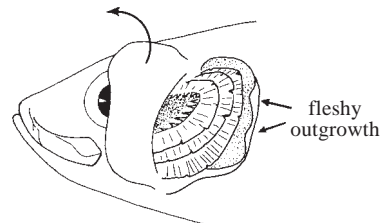


Fig. 11

- 3a. Body deep (27 to 31% standard length); broad silver stripe along flank (stripe width about equal with eye diameter) *Escualosa thoracata*
- 3b. Body relatively elongate (about 25% standard length); silver stripe along flank only about as wide as 1/2 eye diameter *Escualosa elongata*
- 4a. Frontoparietal striae on top of head few, about 3 to 8 (Fig. 12a); lower part of second (posterior) supramaxilla larger than upper (Fig. 12b); 2 posteriormost anal-fin rays usually not enlarged; vertical striae on scales continuous across centre of scale; without perforations on posterior part of scale (*Herklotsichthys*) → 5
- 4b. Frontoparietal striae on top of head numerous, 5 to 19 (Fig. 13a); second supramaxilla symmetrical (Fig. 13b); 2 posteriormost anal-fin rays enlarged; vertical striae on scales variously arranged, discontinuous, overlapped, or continuous at centre of scale; usually with perforations on posterior part of scale → 12

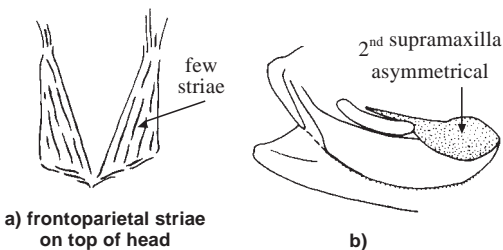


Fig. 12 *Herklotsichthys*

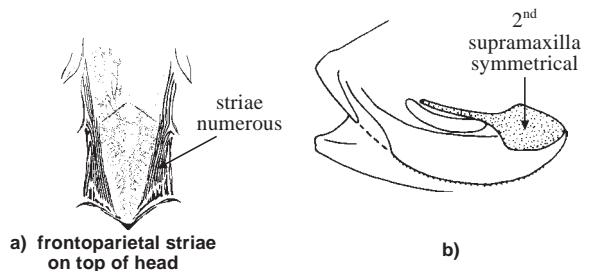


Fig. 13 *Amblygaster, Sardinella*

- 5a. Elongate, wing-like scales present beneath normal paired predorsal scales (Fig. 14) → 6
- 5b. No elongate, wing-like scales present beneath normal paired predorsal scales → 9
- 6a. Series of black spots on flank → 7
- 6b. No black spots on flank → 8

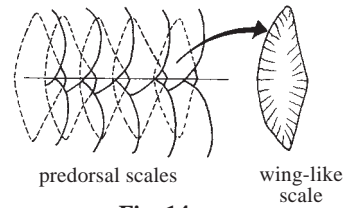


Fig. 14

- 7a. Depth 32 to 41% standard length; flanks with longitudinal series of large, almost oval, black spots, sometimes with a second partial row below; lower gill rakers 28 to 31 *Herklotsichthys koningsbergeri*
- 7b. Depth 27 to 34% standard length; single row of small, round, black spots on flank (best seen in specimens larger than about 6 cm standard length), with a dark spot present behind gill cover; lower gill rakers 28 to 37. *Herklotsichthys lippa*
- 8a. Lower gill rakers 30 to 36; electric blue stripe preceded by 1 or 2 orange spots along flank (in life); dorsal fin without prominent markings *Herklotsichthys quadrimaculatus*
- 8b. Lower gill rakers 38 to 40 (rarely 42); no electric blue stripe or orange spots along sides, instead 1 or more dusky lines from temporal region to caudal peduncle; extreme tip of dorsal fin jet black *Herklotsichthys collettei*
(western Australia; not yet recorded from the area)
- 9a. Two dark, saddle-like, blotches on dorsum; 1 at posterior part of dorsal-fin base, the other located a short distance posterior to the first *Herklotsichthys dispilinotus*
- 9b. No saddle-like blotches on dorsum → 10
- 10a. Three distinct dark lines along upper flank; no dark spot behind gill cover; lower gill rakers greater than 38 → 11
- 10b. No dark lines along upper flank; a single dark spot behind gill cover; lower gill rakers 32 to 38 *Herklotsichthys gotoi*
- 11a. Lower gill rakers 42 to 52 (unusually 51 to 52); tips of pectoral fins reaching, or nearly reaching, posteriorly to vertical through dorsal-fin origin *Herklotsichthys castelnaui*
- 11b. Lower gill rakers 38 to 42; tips of pectoral fins reaching posteriorly to vertical through dorsal-fin origin *Herklotsichthys Blackburni*
(western Australia; not yet recorded from the area)

- 12a. Body subcylindrical, abdomen rather rounded, prepelvic and postpelvic scutes not prominent; lower gill rakers 26 to 43; a median series of predorsal scales (Fig. 15a) (*Amblygaster*) → 13
- 12b. Body more or less compressed, abdomen keeled with prominent pre- and postpelvic scutes; lower gill rakers rarely less than 40 (mostly 45 to 90, but over 200 in some species); predorsal scales usually paired (Fig. 15b) (*Sardinella*) → 15

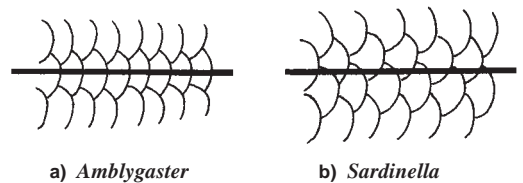


Fig. 15 dorsal view of predorsal scales

- 13a. Series of 10 to 20 blackish spots on flanks; 33 to 43 gill rakers *Amblygaster sirm*
- 13b. No spots present on flanks → 14
- 14a. Lower gill rakers 26 to 31; pelvic-fin insertion about equal with verticals through bases of fifth and ninth dorsal-fin rays *Amblygaster clupeioides*
- 14b. Lower gill rakers 31 to 35; pelvic-fin insertion about equal with point between verticals through bases of first and third dorsal-fin rays *Amblygaster leiogaster*

- 15a. Pelvic fins with i unbranched and 8 branched fin rays; 77 to 188 lower gill rakers; faint golden spot behind gill opening, followed by a faint golden midlateral line; distinct spot at posterior border of gill cover *Sardinella lemuru*
- 15b. Pelvic fins with i unbranched and 7 branched fin rays → 16

- 16a. Vertical striae on scales discontinuous, not meeting at centre → 17
- 16b. Vertical striae on scales continuous, or overlapping, across centre of scale → 22

- 17a. Numerous perforations on posterior part of scales (Fig. 16) → 18
- 17b. Few to no perforations on posterior part of scales → 19

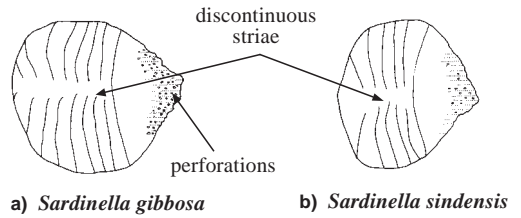


Fig. 16 scales

- 18a. Dark spot at dorsal-fin origin; dorsal and caudal-fin margins dusky; lower gill rakers 45 to 59 *Sardinella gibbosa*
- 18b. No dark spot at dorsal-fin origin; tips of caudal fin black; lower gill rakers 39 to 43 *Sardinella atricauda*

- 19a. Few perforations on posterior part of scales; dark spot at dorsal-fin origin → 20
- 19b. No perforations on posterior part of scales; no dark spot at dorsal-fin origin → 21

- 20a. Lower gill rakers numerous (54 to 82, usually more than 55); scales without well-developed posterior median extensions; perforations on posterior part of scales few *Sardinella fimbriata*
- 20b. Lower gill rakers fewer (41 to 68, usually less than 60); scales somewhat produced posteriorly; perforations on posterior part of scale more numerous *Sardinella albella*

- 21a. Tips of caudal fin black *Sardinella melanura*
- 21b. Tips of caudal fin not black *Sardinella marquesensis*
(Marquesas and Hawaiian Islands; not yet recorded from the area, but may be introduced when used as a baitfish)

- 22a. No perforations on posterior part of scales; tips of dorsal and caudal fins dusky or black; lower gill rakers 87 to 134 *Sardinella fijiense*
- 22b. Numerous small perforations on posterior part of scales; tips of dorsal and caudal fins without dark coloration; lower gill rakers less than 80. → 23

- 23a. Dark spot at dorsal-fin origin; lower gill rakers 48 to 67 *Sardinella brachysoma*
- 23b. No dark spot at dorsal-fin origin; lower gill rakers more numerous (63 to 74) . . . *Sardinella richardsoni*
(western Pacific, Hong Kong, China; not yet recorded from the area)

Key to the species of Pellonulinae occurring in the area

- 1a. A series of predorsal scutes present (Fig. 17) (*Hyperlophus*) → 3
(2 species of small, southern Australian, coastal or estuarine pellonulines)
- 1b. No scutes in midline before dorsal fin → 2

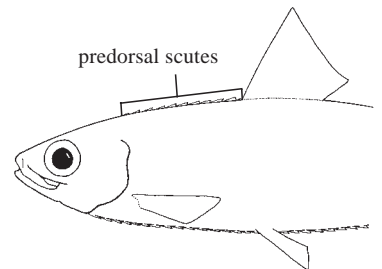


Fig. 17 *Hyperlophus*

- 2a. Teeth in jaws small or minute, absent at sides of lower jaw; lower gill rakers 19 to 27 *Corica*
(2 fresh-water and upper estuarine species, not treated further here)
- 2b. Teeth in jaws enlarged, especially in lower jaw and on premaxillae; present on sides of lower jaw; lower gill rakers 13 to 19 (Fig. 18) *Clupeichthys*
(4 fresh-water species known from the area, not treated further here)
- 3a. Anal-fin origin at or only slightly posterior to vertical through base of posteriormost dorsal-fin ray *Hyperlophus translucidus*
(Queensland and New South Wales; not yet recorded from the area)
- 3b. Anal-fin origin well behind vertical through base of posteriormost dorsal-fin ray *Hyperlophus vittatus*
(southeastern and southwestern Australia; not yet recorded from the area)

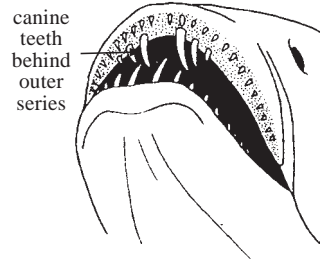


Fig. 18 *Clupeichthys*

Key to the species of Dorosomatinae occurring in the area

- 1a. Last dorsal-fin ray normal, not filamentous (Anodontostoma) → 11
- 1b. Last dorsal-fin ray produced, filamentous (Fig. 19) → 2
- 2a. Mouth inferior or subterminal, upper jaw curved downward; predorsal scales paired and overlapping in midline (Figs 20b and 21b) (Nematalosa) → 4
- 2b. Mouth subterminal, upper jaw straight; predorsal scales paired, but not overlapping in midline (Figs 20a and 21a) → 3

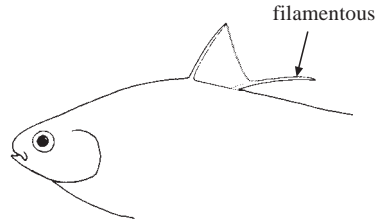


Fig. 19

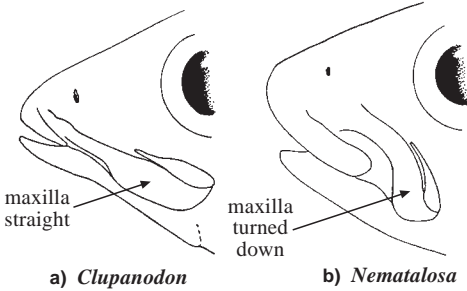


Fig. 20

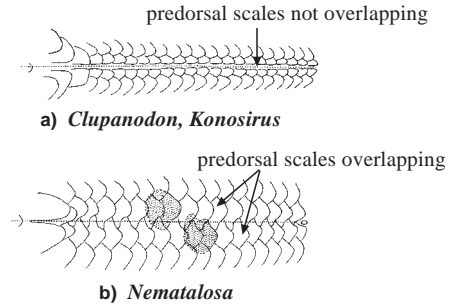


Fig. 21 dorsal view of predorsal scales

- 3a. Postpelvic scutes 11 or 12, predorsal scutes present (Fig. 22) *Clupanodon thrissa*
- 3b. Postpelvic scutes 14 to 16; no predorsal scutes *Konosirus punctatus*
(not yet recorded from the area)
- 4a. Anterior arm of preopercle with third infraorbital bone immediately above it; no fleshy gap. → 5
- 4b. Anterior arm of preopercle with fleshy triangular area above; not covered by third infraorbital bone (Fig. 23) → 6

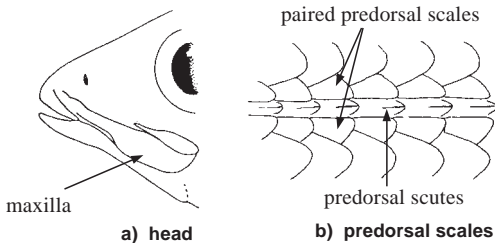


Fig. 22 *Clupanodon thrissa*

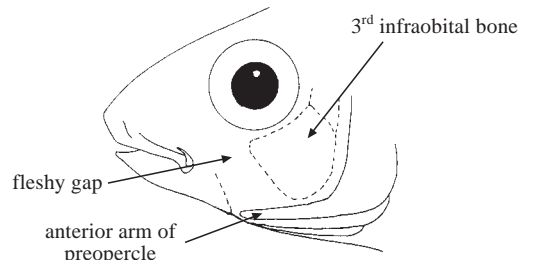


Fig. 23 *Nematalosa come*

- 5a. Pair of grooves in spongy skin on top of head, converging posteriorly; posterior edge of scales not toothed; dark spot behind gill opening followed by a series of smaller spots along flank (Fig. 24) *Nematalosa galathea*
- 5b. No grooves on top of head; posterior edge of scales distinctly toothed; dark spot present behind gill opening, no spots along flanks *Nematalosa nasus*
- 6a. Posterior margin of scales not denticulated → 7
- 6b. Posterior margin of scales denticulated → 10
- 7a. Humeral spot absent; no pectoral axillary scale or only a very short one; estuarine and fresh-water environments *Nematalosa erebi*
- 7b. Humeral spot present; pectoral axillary scale comprised of 2 well-developed scales; marine environments . . . *Nematalosa come*
- 8a. No humeral spot; scales above anal-fin base smaller than those from other regions of body; pectoral axillary scale absent → 9
(fresh waters of New Guinea; perhaps entering estuaries)
- 8b. Humeral spot present; scales above base of anal fin not smaller than those from other regions of body; pectoral axillary scale present → 10
- 9a. Gill rakers 80 to 320 (at 20 cm standard length); gill rakers on lower arch short, about 1.5 to 2.4 in length of corresponding gill filaments *Nematalosa papuensis*
- 9b. Gill rakers 160 to 520 (at 20 cm standard length); gill rakers on lower arch long, 1.1 to 1.5 in length of corresponding gill filaments *Nematalosa flyensis*
- 10a. Posterior margin of opercle mostly straight with slight concavity (indentation) in dorsal aspect; pectoral axillary scale moderately developed; marine environments . . . *Nematalosa japonica*
- 10b. Posterior margin of opercle rounded, strongly convex, without indentation; pectoral axillary scale rudimentary; estuarine to marine environments *Nematalosa vlaminghi*
(western Australia; not yet recorded from the area)
- 11a. Longest gill rakers on lower part of gill arch equal to or longer than corresponding gill filaments; second supramaxilla paddle-shaped *Anodontostoma thailandiae*
- 11b. Longest gill rakers on lower part of gill arch shorter than corresponding gill filaments; second supramaxilla a mere splint (Fig. 25). → 12
- 12a. Posterior margins of scales denticulated; teeth more or less as wide as gaps between them; lower gill rakers 54 to 96 (Fig. 26a) *Anodontostoma chacunda*
- 12b. Posterior margins of scales denticulated; teeth much wider than gaps between them; lower gill rakers numerous (100 to 166) (Fig. 26b) *Anodontostoma selangkat*

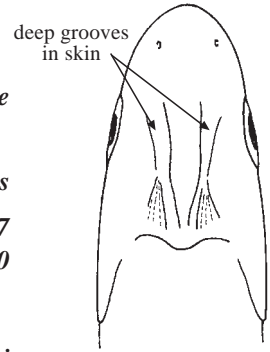


Fig. 24 *Nematalosa galathea*

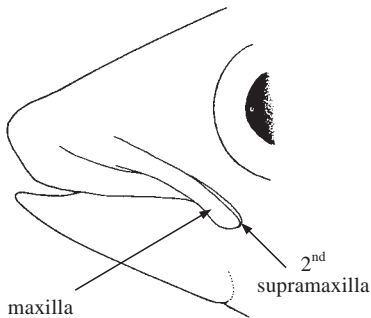


Fig. 25 lateral view of head

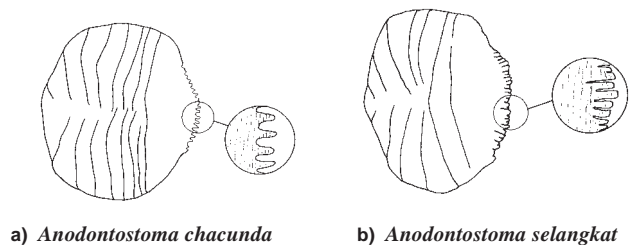


Fig. 26 detail of a scale

Key to the species of Alosinae occurring in the area

Note: species of *Tenualosa* have been previously included in *Hilsa* until the latter was recently restricted to include only *H. kelee*. Five species are currently recognized in *Tenualosa*.

1a. Frontoparietal striae (on top of head) numerous, 8 to 14; gill rakers on inner arches distinctly curled outward; scales perforated (Fig. 27a) . . . *Hilsa kelee*

1b. Frontoparietal striae absent or weakly developed, usually hidden by skin; gill rakers on inner arches straight; scales not perforated (Fig. 27b) (*Tenualosa*) → 2

2a. Gill rakers fine and numerous (80 to 250 on lower part of arch; numbers increasing with size of fish); series of spots along flanks *Tenualosa reevesii*

2b. Gill rakers fine, but not numerous (60 to 100 on lower part of arch; numbers of gill rakers barely increasing after fish reaches 10 cm standard length); no spots along flanks. → 3

3a. Caudal fin relatively long (40 to 42% standard length); caudal-fin lobes long and pointed; gill rakers 60 to 75; 30 to 31 scutes on abdomen; head length 22 to 25% standard length *Tenualosa macrura*

3b. Caudal fin relatively short (31 to 34% standard length); caudal-fin lobes more rounded; gill rakers 60 to 100; 28 to 30 scutes on abdomen; head length 25 to 27% standard length . . . *Tenualosa toli*

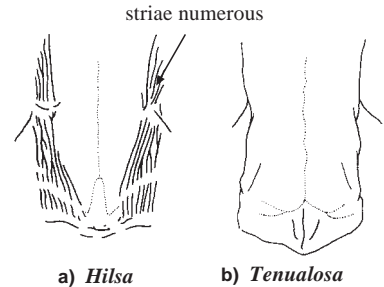



Fig. 27 frontoparietal striae on top of head

List of species occurring in the area

The symbol  is given when species accounts are included. Species with a question mark have not yet been recorded in the area, but should be watched for.

-  *Amblygaster clupeoides* Bleeker, 1849
-  *Amblygaster leiogaster* (Valenciennes, 1847)
-  *Amblygaster sirm* (Walbaum, 1792)
-  *Anodontostoma chacunda* (Hamilton-Buchanan, 1822)
-  *Anodontostoma selangkat* (Bleeker, 1852)
-  *Anodontostoma thailandiae* Wongratana, 1983
-  *Clupanodon thrissa* (Linnaeus, 1758)
- Corica laciniata* Fowler, 1935^{1/}
- Corica soborna* Hamilton-Buchanan, 1822^{1/}
-  *Dussumieria acuta* Valenciennes, 1847
-  *Dussumieria elopsoides* Bleeker, 1849
-  *Escualosa elongata* Wongratana, 1983
-  *Escualosa thoracata* (Valenciennes, 1847)
- ? *Herklotsichthys blackburni* (Whitley, 1948)
-  *Herklotsichthys castelnaui* (Ogilby, 1897)
- ? *Herklotsichthys collettei* Wongratana, 1987
-  *Herklotsichthys dispilonotus* (Bleeker, 1852)
-  *Herklotsichthys gotoi* Wongratana, 1983
-  *Herklotsichthys koningsbergeri* (Weber and de Beaufort, 1912)
-  *Herklotsichthys lippa* (Whitley, 1931)
-  *Herklotsichthys quadrimaculatus* (Rhppell, 1837)
-  *Hilsa kelee* (Cuvier, 1829)

1/ Fresh-water and estuarine species.

- ? *Hyperlophus translucidus* McCulloch, 1917
 ? *Hyperlophus vittatus* (Castelnau, 1875)
 ? *Konosirus punctatus* (Temminck and Schlegel, 1846)
 ✦ *Nematalosa come* (Richardson, 1846)
 ✦ *Nematalosa erebi* (Günther, 1868)
Nematalosa flyensis Wongratana, 19831/
 ✦ *Nematalosa galathea* Nelson and Rothman, 1973
 ✦ *Nematalosa japonica* Regan, 1917
 ✦ *Nematalosa nasus* (Bloch, 1795)
Nematalosa papuensis (Munro, 1964)1/
 ? *Nematalosa vlaminghi* (Munro, 1956)
 ✦ *Sardinella albella* (Valenciennes, 1847)
 ✦ *Sardinella atricauda* (Günther, 1868)
 ✦ *Sardinella brachysoma* (Bleeker, 1852)
 ✦ *Sardinella fijiense* (Fowler and Bean, 1923)
 ✦ *Sardinella fimbriata* (Valenciennes, 1847)
 ✦ *Sardinella gibbosa* (Bleeker, 1849)
 ✦ *Sardinella lemuru* Bleeker, 1853
 ? *Sardinella marquesensis* Berry and Whitehead, 1968
 ✦ *Sardinella melanura* (Cuvier, 1829)
 ? *Sardinella richardsoni* Wongratana, 1983
Sardinella tawilis (Herre, 1927)
 ? *Sardinops neopilchardus* (Steindachner, 1879)
 ✦ *Spratelloides delicatulus* (Bennett, 1832)
 ✦ *Spratelloides gracilis* (Temminck and Schlegel, 1846)
 ✦ *Spratelloides lewisi* Wongratana, 1983
 ? *Spratelloides robustus* Ogilby, 1897
Tenualosa ilisha (Hamilton-Buchanan, 1822)
 ✦ *Tenualosa macrura* (Bleeker, 1852)
 ✦? *Tenualosa reevesii* (Richardson, 1846)
Tenualosa thibaudeaui (Durand, 1940)
 ✦ *Tenualosa toli* (Valenciennes, 1847)

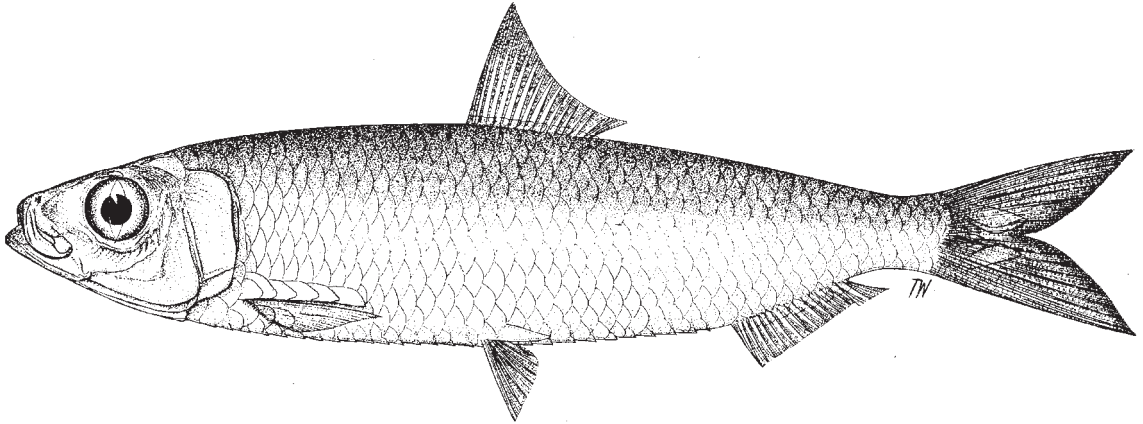
References

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- Wongratana, T. 1983. Diagnoses of 24 new species and proposal of a new name for a species of Indo-Pacific clupeoid fishes. Japan. *J. Ichthyol.*, 29(4):385-407.
- Wongratana, T. 1987. Four new species of clupeoid fishes (Clupeidae and Engraulidae) from Australian waters. *Proc. Biol. Soc. Wash.*, 100(1):104-111.

***Amblyaster clupeoides* Bleeker, 1849**

Frequent synonyms / misidentifications: *Sardinella clupeoides* (Bleeker, 1849) / None.

FAO names: En - Bleeker's smoothbelly sardinella; Fr - Sardinnelle coulat; Sp - Sardinela vientre liso.

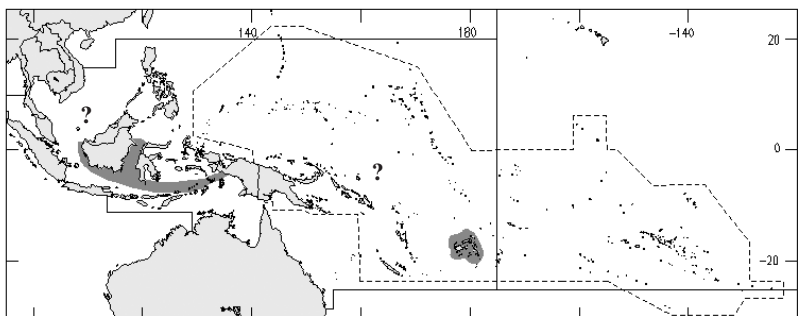


Diagnostic characters: Body moderately slender, depth 24 to 27% of standard length; **abdomen moderately rounded, 16 to 19 (mostly 17) prepelvic and 11 to 14 (mostly 13) postpelvic scutes; scutes not prominent; pelvic scute with ascending arms. Upper jaw rounded without distinct median notch or cleft. Two supramaxillae present; second supramaxilla symmetrical.** Maxilla not reaching posteriorly to vertical through anterior margin of eye. **Prominent patches of teeth on palatines and pterygoids. With 11 to 15 frontoparietal striae on top of head. Two fleshy outgrowths on posterior margin of gill opening. Opercle smooth, without bony striae. Lower gill rakers 26 to 31.** Branchiostegal rays usually 6, rarely 5. Dorsal-fin origin only slightly anterior to midpoint of body. Anal fin well posterior to vertical through base of posteriormost dorsal-fin ray; **2 posteriormost anal-fin rays enlarged.** Tips of pectoral fins not reaching vertical through origin of dorsal fin. **Pelvic-fin insertion about equal with point between verticals through bases of fifth to ninth dorsal-fin rays; pelvic fins with 1 unbranched and 7 branched soft rays. Vertical striae not continuous across centre of scale. A median series of predorsal scales present. Colour:** no spots along flanks.

Size: Maximum standard length 17 cm, commonly to 15 cm.

Habitat, biology, and fisheries: Coastal, pelagic, schooling. Feeds on copepods, *Mysis*, and other elements in the zooplankton. No separate statistics, but evidently enters some local artisanal fisheries, at least in small numbers.

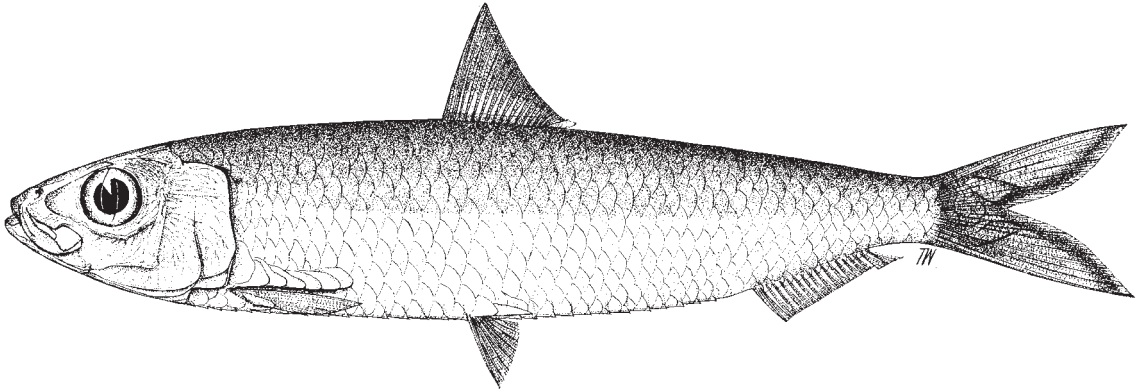
Distribution: Indo-West Pacific from southern coasts of India to Indonesia, Irian Jaya, and also Fiji.



Amblygaster leiogaster (Valenciennes, 1847)

Frequent synonyms / misidentifications: *Clupea okinawensis* Kishinouye, 1908; *Sardinella leiogaster* Valenciennes, 1847 / None.

FAO names: En - Smoothbelly sardinella; Fr - Sardinella daniva; Sp - Sardinella daniva.

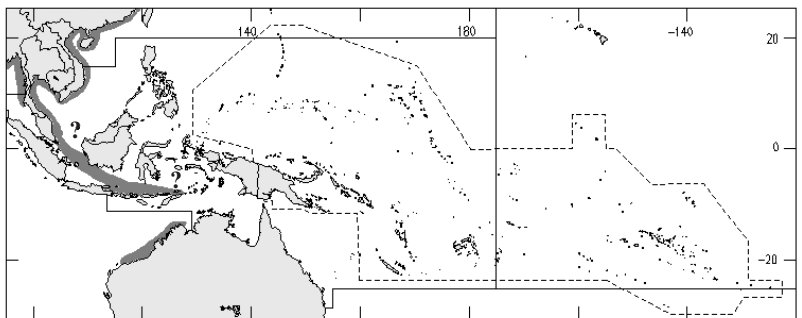


Diagnostic characters: Body subcylindrical, moderately slender, depth 21 to 25% of standard length; abdomen moderately rounded, 17 or 18 prepelvic and 13 to 15 postpelvic scutes (total 30 to 33, mostly 29 to 31); scutes not prominent; pelvic scute with ascending arms. Upper jaw rounded without distinct median notch or cleft. Two supramaxillae present; second supramaxilla symmetrical. Posterior end of maxilla just reaching vertical through anterior margin of eye. Prominent patches of teeth on palatines and pterygoids. With 12 to 16 frontoparietal striae on top of the head. Two fleshy outgrowths on posterior margin of gill opening. Opercle smooth, without bony striae. Lower gill rakers 31 to 35. Branchiostegal rays usually 6. Dorsal-fin origin well anterior to midpoint of body. Anal fin well posterior to vertical through base of posteriormost dorsal-fin ray; 2 posteriormost anal-fin rays enlarged. Tips of pectoral fins not reaching vertical through origin of dorsal fin. Pelvic-fin insertion about equal with point between verticals through bases of first and third dorsal-fin rays; pelvic fins with 1 unbranched and 7 branched soft rays. Vertical striae not continuous across centre of scale. A median series of predorsal scales present. **Colour:** blue-green above and silvery below, without spots along flanks; dorsal fin blackish (or dusky when fully extended).

Size: Maximum standard length 23 cm, commonly to 18 cm.

Habitat, biology, and fisheries: Coastal, pelagic, schooling. More data needed. No separate statistics reported, but evidently enters some local artisanal fisheries, at least in small numbers. Caught mainly with purse seines and set nets. Marketed fresh, dried, dried-salted, boiled, or made into fish balls.

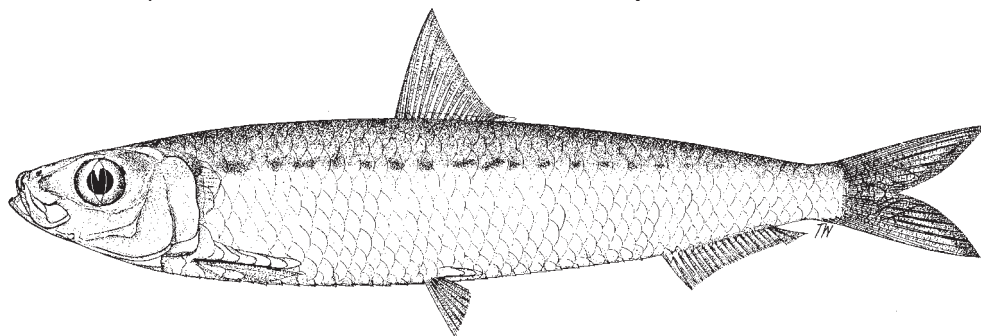
Distribution: Indo-West Pacific from Africa eastward to Okinawa; also Indonesia, Gulf of Thailand, and Western Australia.



Amblygaster sirm (Walbaum, 1792)

Frequent synonyms / misidentifications: *Clupea pinguis* Günther, 1872; *Sardinella leiogastroides* Bleeker, 1854; *S. sirm* (Walbaum, 1792); *Sardinops dakini* Whitley, 1937 / None.

FAO names: En - Spotted sardinella; Fr - Sardinelle tachetée; Sp - Sardinela manchada.

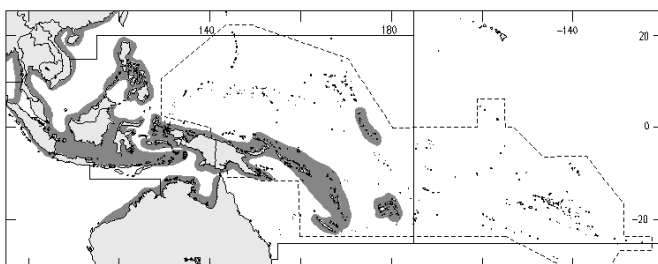


Diagnostic characters: Body slender, subcylindrical, abdomen rather rounded with 16 to 18 (mostly 17) prepelvic and 13 to 15 (mostly 14) postpelvic scutes; scutes not prominent; pelvic scute with ascending arms. Upper jaw rounded without distinct median notch or cleft. Two supramaxillae present; second supramaxilla symmetrical. Maxilla just reaching posteriorly to vertical through anterior margin of eye. Prominent patches of teeth on palatines and pterygoids. With 8 to 19 (mostly 13 to 16) frontoparietal striae on top of the head. Two fleshy outgrowths on posterior margin of gill opening. Opercle smooth, without bony striae. Lower gill rakers 33 to 43. Branchiostegal rays usually 6. Dorsal-fin origin moderately anterior to midpoint of body. Anal fin well posterior to vertical through base of posteriormost dorsal-fin ray; anal-fin rays 18 to 20; 2 posteriormost anal-fin rays enlarged. Tips of pectoral fins not reaching vertical through origin of dorsal fin. Pelvic-fin insertion about equal with point between verticals through bases of sixth to tenth dorsal-fin rays; pelvic fins with 1 unbranched and 7 branched soft rays. Vertical striae not continuous across centre of scale. A median series of predorsal scales present. **Colour:** dorsum darkly coloured blue-green, flanks silvery; lower head gold, and usually with a lateral series of 10 to 20 dark bluish gold spots (black in preservation); dorsal and caudal fins dusky yellow and other fins pale.

Size: Maximum standard length 23 cm, commonly to about 20 cm.

Habitat, biology, and fisheries: Coastal, pelagic, schooling. Inhabits coral reef lagoons and adjacent waters. Schools located near the bottom during the day, dispersing into the mid and upper waters of the lagoon during the night to feed. Feeds mainly on copepods, nauplii and zoea larvae, larval bivalves, and the gastropods *Peridinium* and *Ceratium*; juveniles also feed on phytoplankton. In the Western Central Pacific, reported to be a fast-growing and short-lived species. In Kiribati, maximum size reported was 23 cm standard length and 130 g, lifespan was 2 to 4 years, with most 2 years of age or less. In New Caledonia, maximum size reported was 24 cm standard length, and lifespan of most fish was less than 2 years of age. Maturity estimated at 14 to 15 cm standard length, at an estimated age of about 223 days (Kiribati), and 16 to 17 cm standard length and 1 year (New Caledonia). Females reportedly mature at larger sizes than males. Multiple spawner, but protracted spawning season with periods of intense spawning activity in August to October and May to June (Kiribati), and October to December (New Caledonia). Spawning occurs during early part of night, probably prior to midnight. Reproductive life span estimated to be 45 to 75 days. Batch fecundity about 16 000 to 22 000 eggs/spawning. Relative fecundity about 162 to 204 (eggs/g). No separate statistics; enters some local artisanal fisheries, e.g. in Tuticorin Bay in November-March, and in Fiji. Commercial size of 10 to 18 cm total length reported for the Philippines. Common and often dominant tuna baitfish species in some parts of the area. Collected by boat and shore seines, small-meshed encircling gill nets, purse seines, and bamboo stake traps. Marketed fresh, dried, dried-salted, or made into fish balls.

Distribution: Widespread in tropical Indo-West Pacific from the Red Sea and Madagascar, eastward to Indonesia, Gulf of Thailand, New Guinea, and the Philippines; north to Taiwan Province of China, and Okinawa; southward to northern coasts of Australia and New Caledonia; eastward to Kiribati and Fiji.

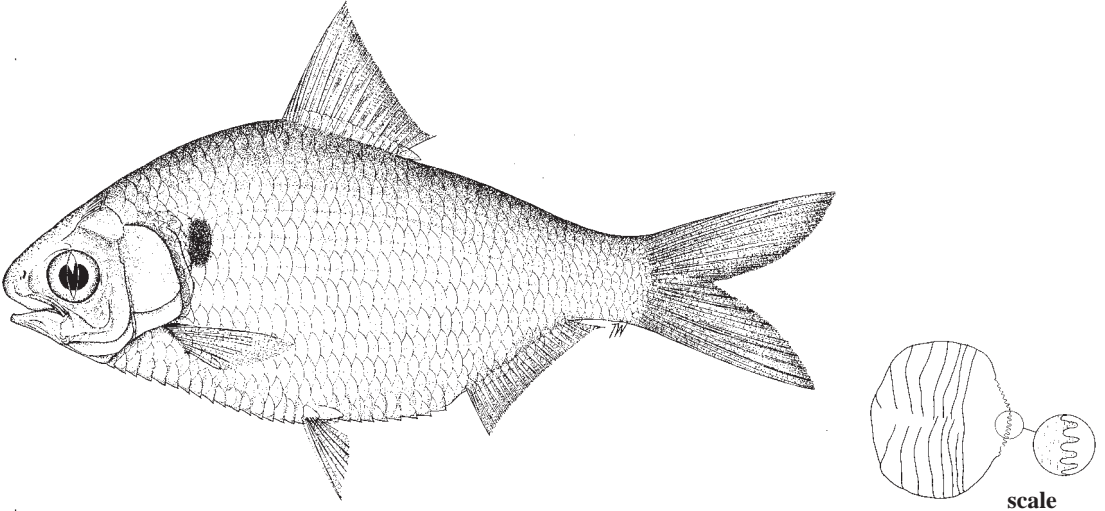


Anodontostoma chacunda (Hamilton-Buchanan, 1822)

CHG

Frequent synonyms / misidentifications: *Dorosoma chacunda* (Hamilton-Buchanan, 1822); *Anodontostoma hasseltii* Bleeker, 1849; *Clupanodon chanpole* Hamilton-Buchanan, 1822; *Gonostoma javanicum* Hyrtl, 1855 / None.

FAO names: **En** - Chacunda gizzard shad; **Fr** - Alose chaconde; **Sp** - Sábalo chacunda.

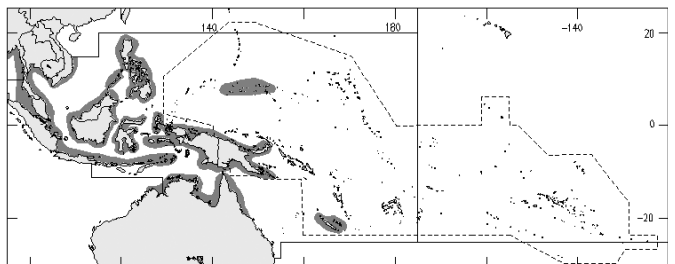


Diagnostic characters: A medium-sized marine gizzard shad; body almost oval, compressed, very deep, depth increasing with size of fish (40 to 60% of standard length in fishes over 10 cm); abdomen fully scuted; pelvic scute with ascending arms. Mouth inferior; second supramaxilla a mere splint; upper jaw slender at tip and not strongly turned downward; upper jaw with distinct median notch when seen from in front. Maxilla reaching posteriorly to a vertical through midpoint of eye. Lower jaw short, its edges strongly flared outward. No fleshy outgrowths on posterior margin of gill opening. Opercle smooth, without bony striae. Gill rakers fine and numerous; lower gill rakers 50 to 96 (for fishes with 4 to 14 cm standard length); longest gill rakers on lower part of arch less than corresponding gill filaments (and much less in larger fishes). Dorsal-fin origin distinctly anterior to midpoint of body; last dorsal-fin ray not filamentous. Anal fin much shorter than head; anal fin lying well posterior to vertical through base of posteriormost dorsal-fin ray; with 15 to 20 (usually 16 to 19) branched fin rays. Pelvic-fin insertion at about vertical through middle of dorsal fin; pelvic fins with i unbranched and 7 branched soft rays. Scales moderately large, 38 to 45 (usually 40 to 43) in lateral series. Predorsal scales forming a single median series, postdorsal scales with posterior margin elongated. Posterior margins of scales denticulated; teeth slightly larger than gaps between them. Colour: a large black spot behind gill opening; large part of nape yellowish, otherwise flanks silvery; fins generally pale, caudal fin yellowish.

Size: Maximum standard length 17.5 cm, commonly between 10 and 14 cm.

Habitat, biology, and fisheries: Marine, pelagic, and inshore; also in estuaries. Feeds on diatoms, radiolarians, molluscs, copepods, and crustaceans (in that order of importance, at least in the Godavari estuary, India). Breeds from November to February, mainly in the latter part (Godavari estuary). Local contributions to fisheries, e.g. November to June in Godavari estuary, but no special fishery. Caught with purse seines, lift nets, and set nets. Marketed fresh, dried, dried-salted, boiled, or made into fish meal. From 1990 to 1995, FAO's Yearbook of Fishery Statistics reports a range of yearly production of around 700 to 4 200 t of this species from the Western Central Pacific (Malaysia, Philippines).

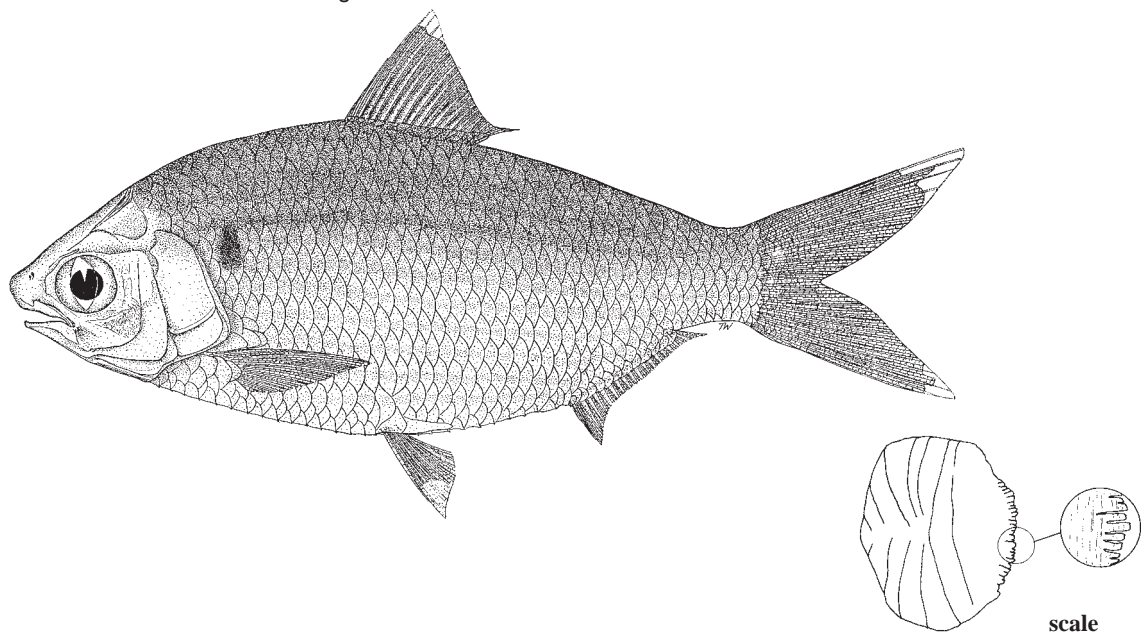
Distribution: Widespread in Indo-West Pacific from the Persian Gulf to coasts of India and Andaman Sea, to Gulf of Thailand, Indonesia, Viet Nam, and the Philippines; south to northern Australia, Caroline Islands, and New Caledonia.



Anodontostoma selangkat (Bleeker, 1852)

Frequent synonyms / misidentifications: *Chatoessus breviceps* Peters, 1877 / *Anodontostoma chacunda* (Hamilton-Buchanan, 1822).

FAO names: En - Indonesian gizzard shad.

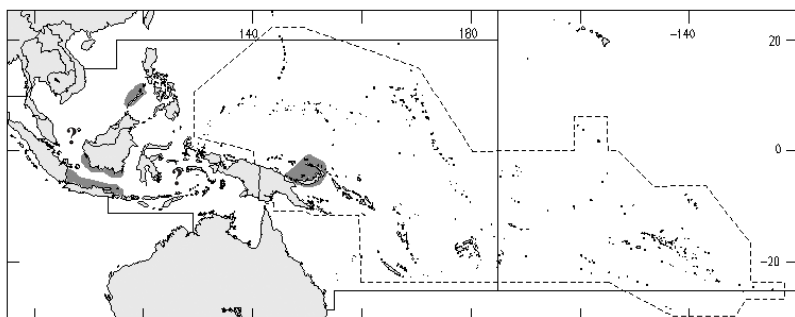


Diagnostic characters: A medium-sized marine gizzard shad; **body very deep, depth increasing with size of fish (40 to 50% of standard length in fishes over 9 cm); abdomen fully scuted; pelvic scute with ascending arms. Mouth inferior; upper jaw slender at tip and not strongly turned downward; upper jaw with distinct median notch when seen from in front; second supramaxilla a mere splint. Maxilla reaching posteriorly about to a vertical through middle of eye. Lower jaw short, its edges strongly flared outward. No fleshy outgrowths on posterior margin of gill opening. Opercle smooth, without bony striae. Lower gill rakers fine and numerous 100 to 166 (for fishes 9 to 18 cm of standard length); longest gill rakers on lower part of arch less than corresponding gill filaments (and much less in larger fishes). Dorsal-fin origin distinctly anterior to midpoint of body; last dorsal-fin ray not filamentous. Anal fin much shorter than head; origin posterior to vertical through base of posteriormost dorsal-fin ray; with 15 to 19 (usually 15 to 18) branched fin rays. Pelvic-fin insertion about at vertical through middle of dorsal fin; pelvic fins with 1 unbranched and 7 branched soft rays. Scales moderately large, 39 to 43 in lateral series. Predorsal scales forming a single median series, postdorsal scales with posterior margin elongated. Posterior margins of scales denticulated; with very narrow gaps between them. Colour: a large dark blotch on shoulder posterior to gill opening, followed by longitudinal streaks along flanks.**

Size: Maximum standard length 18 cm.

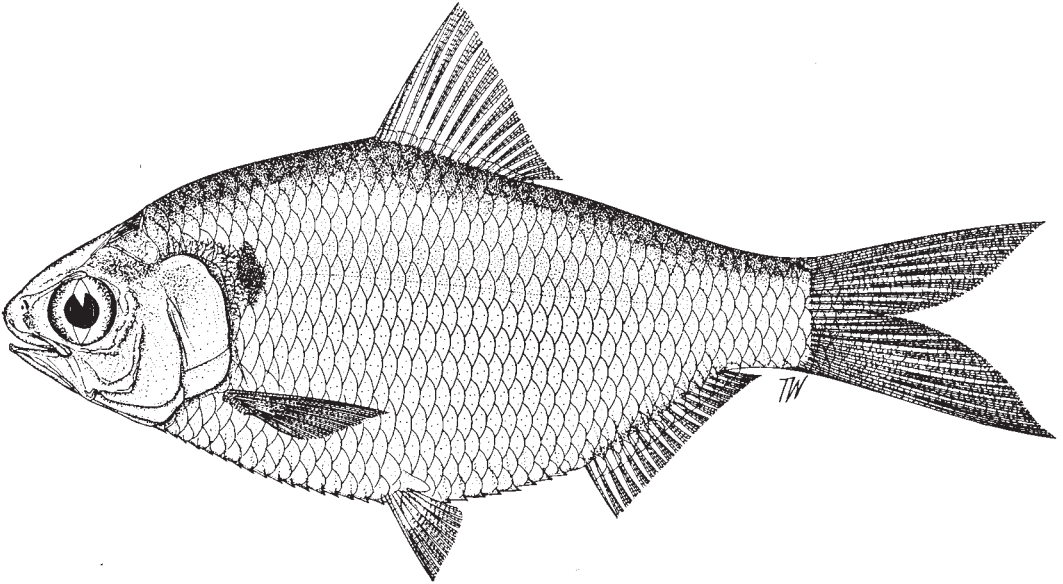
Habitat, biology, and fisheries: Marine, pelagic, and inshore (probably a similar biology to *Anodontostoma chacunda*). No separate fisheries data.

Distribution: Indo-West Pacific from Andaman Islands (a single specimen), to Java Sea, the Philippines, and eastward to Bismark Archipelago.

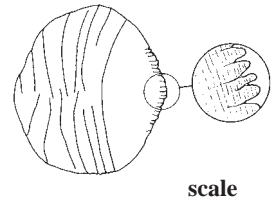


Anodontostoma thailandiae Wongratana, 1983

Frequent synonyms / misidentifications: None / *Anodontostoma chacunda* (Hamilton-Buchanan, 1822).
FAO names: En - Thai gizzard shad.



Diagnostic characters: A medium-sized marine gizzard shad; **body very deep, depth increasing with size of fish (ca. 40 to 60% standard length in fishes over 8 cm); abdomen fully scuted; pelvic scute with ascending arms. Mouth inferior; second supramaxilla paddle-shaped; upper jaw slender at tip and not strongly turned downward; upper jaw with median notch when seen from in front. Maxilla reaching posteriorly about to a vertical through middle of eye. Lower jaw short, its edges strongly flared outward. No fleshy outgrowth on posterior margin of gill opening. Opercle smooth, without bony striae. Gill rakers fine and numerous; lower gill rakers 46 to 140 (for fish 4 to 14.1 cm of standard length); longest gill rakers on lower part of arch equal to or longer than corresponding gill filaments.** Dorsal-fin origin distinctly anterior to body midpoint; **last dorsal-fin ray not filamentous.** Anal fin much shorter than head; origin posterior to vertical through bases of posteriormost dorsal-fin ray; with 17 to 20 (usually 17 to 19) branched fin rays. Pelvic-fin insertion at vertical through bases of anterior dorsal-fin rays; pelvic fins with 1 unbranched and 7 branched soft rays. **Scales moderately large, 38 to 45 (usually 40 to 43) in lateral series. Predorsal scales forming a single median series, postdorsal scales with posterior margin elongated. Posterior margin of scales denticulated, with very narrow gaps between them. Colour: a large dark blotch on shoulder posterior to gill opening.**

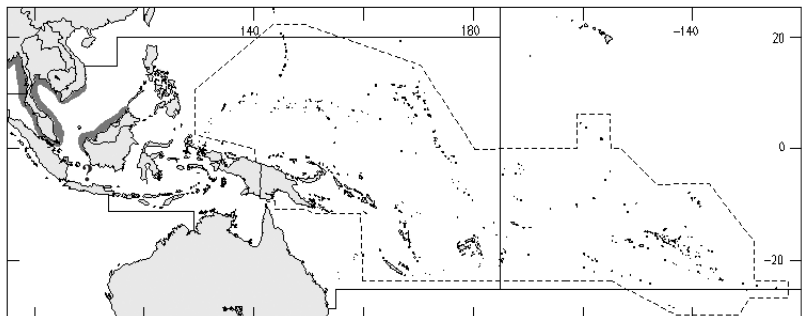


scale

Size: Maximum standard length 18 cm, commonly between 10 and 14 cm.

Habitat, biology, and fisheries: Marine, pelagic, and inshore, probably entering estuaries (biology probably similar to *Anodontostoma chacunda*). Not distinguished from *A. chacunda*. No fisheries data available.

Distribution: Indo-West Pacific from northern Bay of Bengal, to Andaman Sea at Phuket, Thailand, Gulf of Thailand, South China Sea, and possibly also Java Sea.

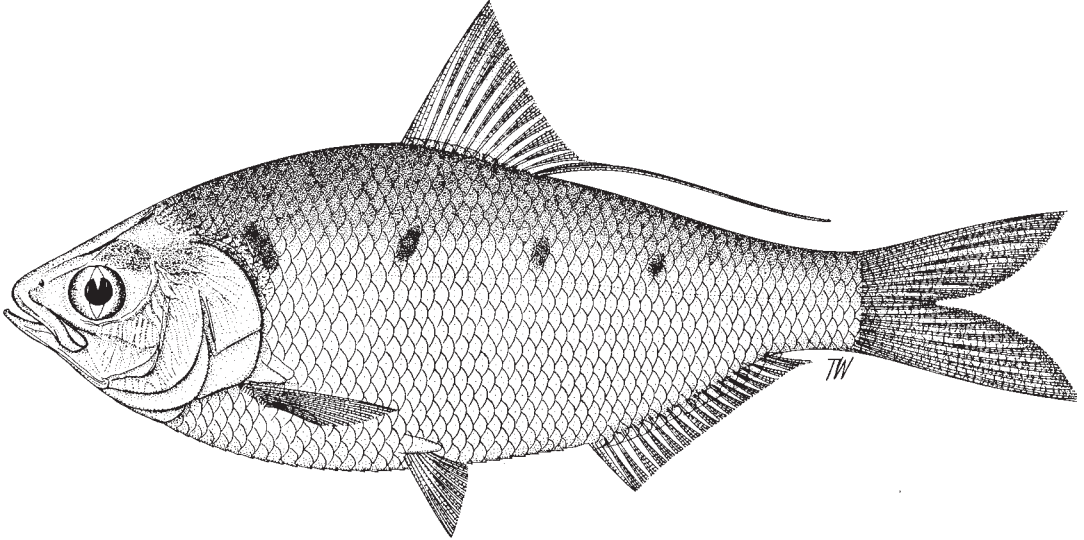


Clupanodon thrissa (Linnaeus, 1758)

DAS

Frequent synonyms / misidentifications: *Chatoessus maculatus* Richardson, 1846; *Clupanodon haihoensis* Oshima, 1926; *Clupea triza* Linnaeus, 1759 / *Konosirus punctatus* (Temminck and Schlegel, 1846).

FAO names: En - Chinese gizzard shad; Fr - Alose à museau court; Sp - Alosa chata.

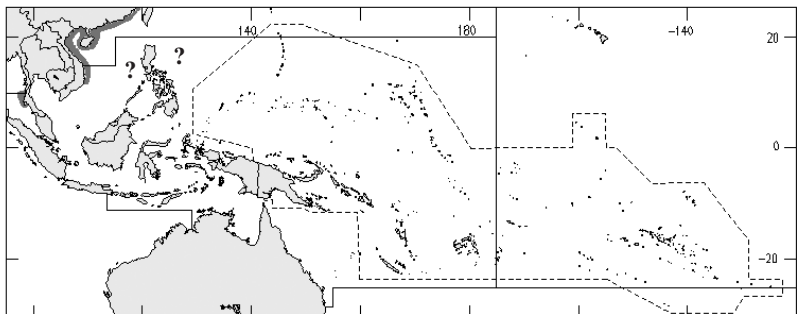


Diagnostic characters: A medium-sized marine gizzard shad; **body compressed, moderately deep, depth 33 to 37% of standard length; abdomen fully scuted, with 17 or 18 (usually 18) prepelvic and 11 or 12 postpelvic scutes; total number of scutes 28 to 30 (usually 29 or 30); pelvic scute with ascending arms. Mouth subterminal; upper jaw straight, with a distinct median notch. Maxilla slender, not turned downward at tip, with a single spatulate supramaxilla. No fleshy outgrowths on posterior margin of gill opening. Opercle smooth, without bony striae. Gill rakers fine and numerous (about 200 to 400, increasing with size of fish), at least 3/4 length of corresponding gill filaments on first arch. Branchiostegal rays 6; 2 on posterior ceratohyal. Dorsal-fin origin moderately before midpoint of body; last dorsal-fin ray filamentous. Anal fin shorter than head, with 21 to 26 total fin rays; anal fin lying slightly posterior to vertical through base of posteriormost dorsal-fin ray. Pelvic-fin insertion anterior to or at vertical through dorsal-fin origin; pelvic fins with 1 unbranched and 7 branched soft rays. Scales moderate, lateral scales 45 to 50. Predorsal scutes present, 17 to 26 (usually 20 to 25); 21 to 25 predorsal scales paired but not overlapping in midline. A single small pectoral axillary scale. Colour:** a dark spot behind gill opening, followed by additional spots on flank.

Size: Maximum standard length about 26 cm.

Habitat, biology, and fisheries: Coastal and in rivers, presumably tolerating brackish water, if not fully fresh conditions. More data needed. Of small local interest in Taiwan Province of China and Korea. Ranges of *Clupanodon thrissa* and *Konosirus punctatus* overlap in East China Sea (Hong Kong north to Taiwan Province of China); possibly both species have been confused in this area.

Distribution: Northwestern Pacific from China (to about 25°N), apparently south to Viet Nam, but Philippine records appear doubtful; also recorded from Phuket Island, Thailand (Andaman Sea).

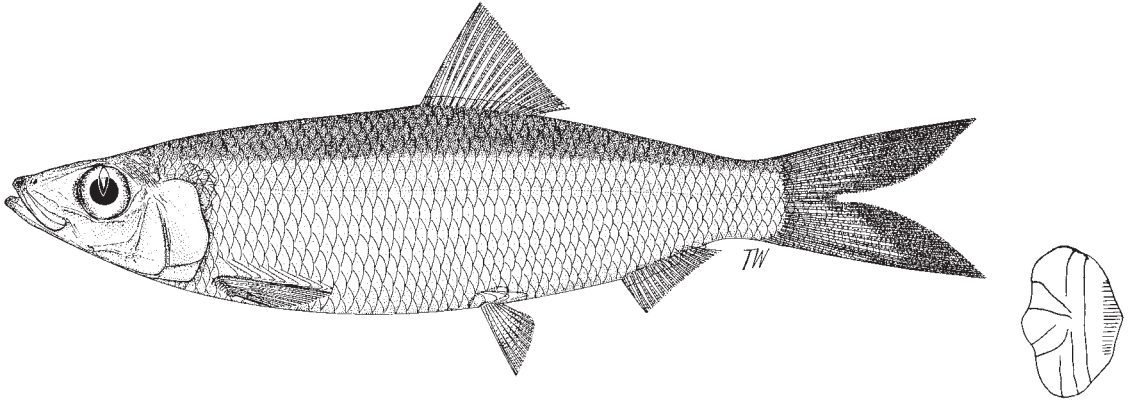


Dussumieria acuta Valenciennes, 1847

RAS

Frequent synonyms / misidentifications: *Dussumieria hasselti* Bleeker, 1851; *Etrumeus albulina* Fowler, 1934 / *Dussumieria elopsoides* Bleeker, 1849.

FAO names: **En** - Rainbow sardine; **Fr** - Sardine arc-en-ciel; **Sp** - Sardina arco iris.



scale

Diagnostic characters: Body elongate, cylindrical, depth 22 to 29% of standard length; abdomen rounded, without prepelvic and postpelvic scutes, but W-shaped pelvic scute present. Premaxillae rectangular, giving distinctive appearance to mouth. Lower gill rakers 19 to 26. Branchiostegal rays numerous (12 to 15). Isthmus tapering evenly forward, without lateral flanges or “shoulders”. Dorsal-fin origin slightly posterior to midpoint of body. Anal fin distinctly posterior to vertical through bases of posteriormost dorsal-fin rays. Pelvic-fin insertion positioned about at vertical through base of middle dorsal-fin rays. Scales in lateral series 52 to 59, mostly 53 to 56. Posterior part of scales characteristically marked with numerous tiny radiating striae. **Colour:** back iridescent blue with a shiny gold-brass line below (quickly fading after death) extending from opercle to base of caudal fin; silvery white below; posterior margin of tail broadly dark; first rays of dorsal and pectoral fins dusky; pelvic and anal fins hyaline; scales on upper part of flanks usually with submarginal dusky margin posteriorly.

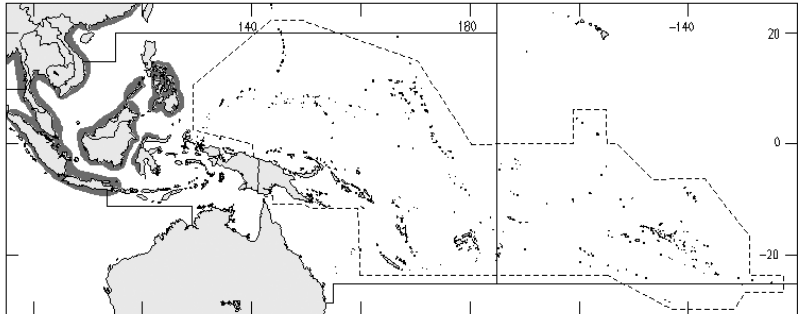
Size: Maximum standard length about 20 cm, commonly between 10 and 15 cm.

Habitat, biology, and fisheries: Marine, pelagic, mainly inshore fishes. Distinct diurnal variation in feeding habits with active feeding on planktonic crustaceans and smaller fishes occurring during daytime. Good catches are made in Palk Bay and Gulf of Mannar (southern India). Contribute to general clupeoid catches, significantly so in Indonesia and the Philippines. Separate statistics only recorded from Hong Kong, Indonesia, and the Philippines (the last 2 most likely with *Dussumieria elopsoides* also included). From 1990 to 1995, FAO's Yearbook of Fishery Statistics reports a range of yearly catch of *D. acuta* of around 23 700 to 36 000 t from the Western Central Pacific (Indonesia, Philippines). Caught with gill nets and also beach seines, and purse seines. Marketed fresh, dried, dried-salted, or made into fish balls or fish meals.

Distribution: Widespread in warmer waters of Indo-Pacific from the Persian Gulf (perhaps south to Somalia), to India, Indonesia, Malaysia, Thailand, the Philippines, and northward to Fochow. Earlier records included *D. elopsoides*.

Remarks: *Dussumieria* is known to include at least 2 morphologically similar species whose ranges overlap

in the Persian Gulf, around Indian coasts, Indonesia, Malaysia, and Thailand. Even more slender specimens (depth 16.7 to 17.2% standard length) have been reported from Fiji, which have a lower gill raker count of only 20 or 21 (cf. 21 to 32 in *D. elopsoides*), indicating that possibly a third species is present.

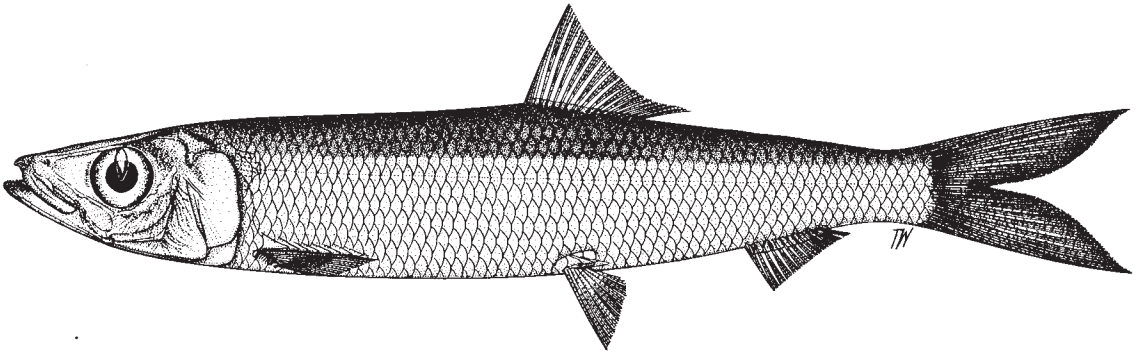


Dussumieria elopsoides Bleeker, 1849

RAL

Frequent synonyms / misidentifications: *Dussumieria hasseltii* Bleeker, 1851; *D. productissima* Chabanaud, 1933 / *Dussumieria acuta* Valenciennes, 1847.

FAO names: En - Slender rainbow sardine.

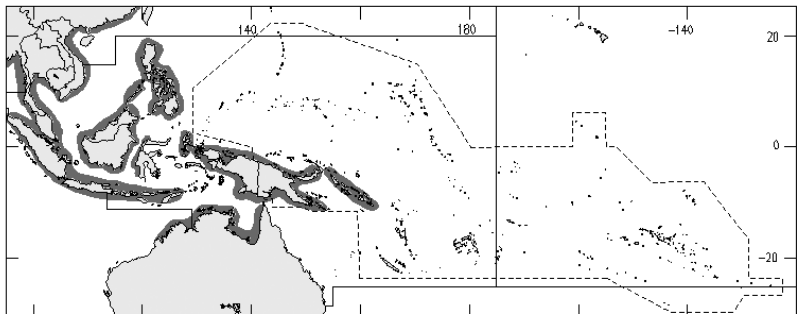


Diagnostic characters: Body elongate, slender, depth usually 16 to 22% of standard length; abdomen rounded, without prepelvic and postpelvic scutes, but W-shaped pelvic scute present. Premaxillae rectangular, giving distinctive appearance to mouth. Lower gill rakers 21 to 32. Branchiostegal rays numerous (13 to 18). Isthmus tapering evenly anteriorly, without lateral flanges or "shoulders". Dorsal-fin origin slightly posterior to midpoint of body. Anal fin distinctly posterior to vertical through bases of posteriormost dorsal-fin rays. Pelvic-fin insertion positioned about at vertical through base of middle dorsal-fin rays. Scales in lateral series 54 to 63, mostly 56 to 60. No striae on posterior part of scales. **Colour:** upper half of body iridescent greenish blue with a narrow lateral band of silvery grey and gold extending from upper operculum to caudal-fin base. Silvery white on lower flanks and abdomen; upper surface of eye and head emerald-green; snout strongly pigmented; fins pale; caudal fin dusky with dark posterior margin.

Size: Maximum standard length about 20 cm.

Habitat, biology, and fisheries: Presumably similar life history attributes to those of *Dussumieria acuta*, but the species were not distinguished in earlier studies. Contributes to general clupeoid catches, significantly so in Indonesia and the Philippines. Fisheries data are combined with that for *D. acuta*.

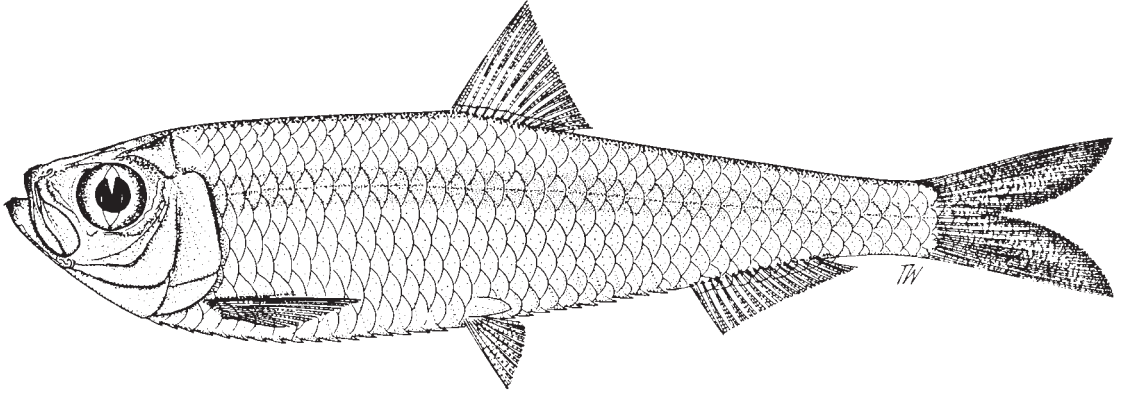
Distribution: Indo-Pacific from Suez and western Indian Ocean (Persian Gulf to Mombasa, possibly Madagascar) to India, Indonesia, Malaysia, and Thailand; northward to China and eastward to Caroline and Marshall Islands and perhaps also Solomon Islands. Also in eastern Mediterranean where reported as *D. acuta*.



Escualosa elongata Wongratana, 1983

Frequent synonyms / misidentifications: None / None.

FAO names: En - Slender white sardine.

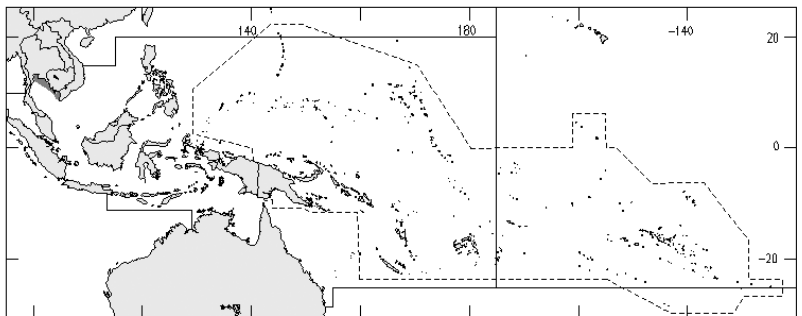


Diagnostic characters: Body slender, depth 25% of standard length; abdomen strongly keeled with 18 prepelvic and 11 (rarely 10 or 12) postpelvic scutes; pelvic scute with ascending arms. Upper jaw rounded, without distinct median notch or cleft. Two supramaxillae present; second supramaxilla almost rectangular. Posterior tip of maxilla and second supramaxilla enlarged. Posterior margin of gill opening evenly rounded, without fleshy outgrowths. Lower gill rakers 41. Dorsal-fin origin slightly anterior to midpoint of body. Anal fin well posterior to vertical through bases of posteriormost dorsal-fin rays; short, with iii unbranched and 16 branched soft fin rays. Pelvic-fin insertion about equal with vertical through third dorsal-fin ray; pelvic fins with i unbranched and 6 branched soft rays. Caudal peduncle relatively narrow (depth 8.3% of standard length). **Colour:** narrow bright silver stripe along flank (only about 1/2 eye diameter in width).

Size: Maximum standard length 6.7 cm.

Habitat, biology, and fisheries: Presumed marine and coastal pelagic, more data needed.

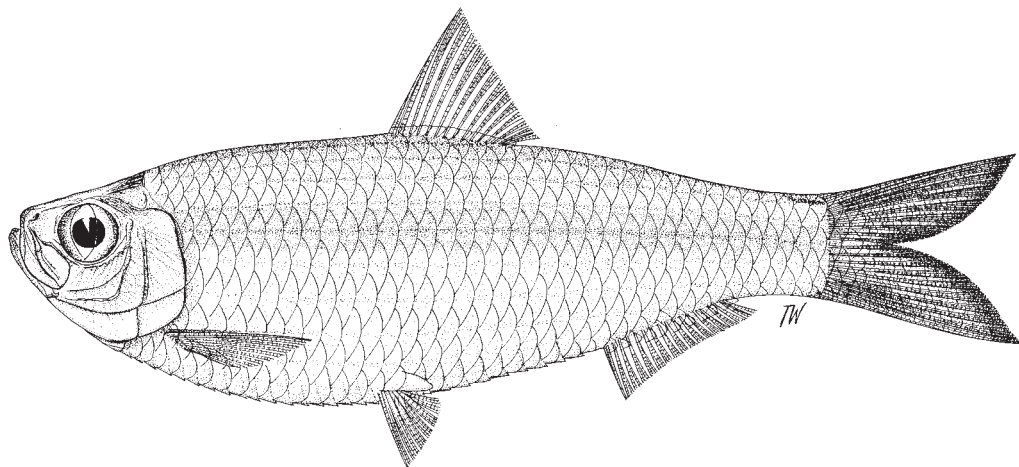
Distribution: Known from only 2 specimens at east coast of Gulf of Thailand (but discovered at Sunday market in Bangkok).



Escualosa thoracata (Valenciennes, 1847)

Frequent synonyms / misidentifications: *Clupea* (*Leptogaster*) *argyrotaenia* (Bleeker, 1852); *C. huae* Tirant, 1883; *C. macrolepis* Steindachner, 1879; *Kowala coval* (Cuvier, 1829); *Meletta lile* Valenciennes, 1847 / None.

FAO names: **En** - White sardine; **Fr** - Alose blanche; **Sp** - Sardina blanca.



Diagnostic characters: Body fairly deep and compressed, depth 27 to 37% of standard length; abdomen strongly keeled with 18 (rarely 17 or 19) prepelvic and 11 (rarely 10 or 12) postpelvic scutes; total number of scutes 29 (rarely 28 or 30); pelvic scute with ascending arms. Upper jaw rounded, without distinct median notch or cleft. Two supramaxilla present; second supramaxilla almost rectangular. Posterior tip of maxilla and second supramaxilla enlarged. Posterior margin of gill opening evenly rounded, without fleshy outgrowths. Lower gill rakers 27 to 40. Dorsal-fin origin slightly anterior to midpoint of body. Anal fin well posterior to vertical through bases of posteriormost dorsal-fin rays. Pelvic fins usually at, or anterior to, vertical through base of anteriormost dorsal-fin ray; pelvic fins with 1 unbranched and 6 branched soft rays. Caudal peduncle relatively deep (10.7 to 13.2% of standard length). **Colour:** broad, bright silver stripe about equal to eye diameter present along flanks; inner edges of caudal fin broadly darkish.

Size: Maximum standard length 10 cm, commonly to 8 cm.

Habitat, biology, and fisheries: Coastal, pelagic, schooling in shallow waters, the juveniles apparently entering lower reaches of rivers, but returning later to the sea. Feeds on zooplankton (copepods, crab zoea, bivalve larvae, and fish eggs) and phytoplankton. Breeds from October to February (primarily November to January) off western coasts of India, usually in relatively shallow inshore waters. An important element in clupeoid fisheries off western coast of India. Separate statistics not reported. In Thailand, juveniles (2.5 to 4 cm of standard length) are caught in large numbers. They are dried for human consumption. Infrequently, this species occurs in mixed catches with *Stolephorus*.

Distribution: Indo-West Pacific from northern Indian Ocean (Karachi eastward to Rangoon) to Indonesia (Java Sea), Thailand, the Philippines southward to Papua New Guinea and Australia (Queensland at Townsville and western Australia at Onslow).

