

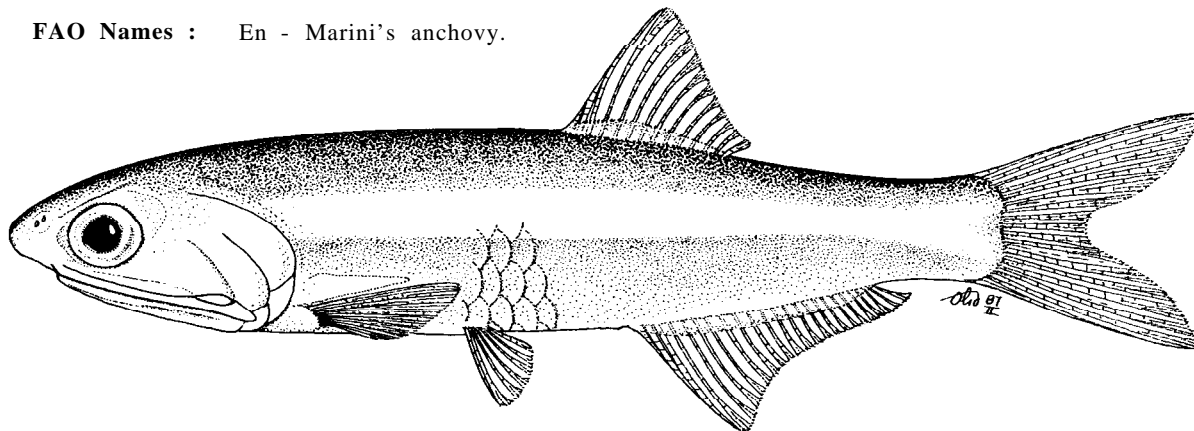
Anchoa marinii Hildebrand, 1943

ENGR Ancho 11

Anchoa marinii Hildebrand, 1943. Bull.Bingham oceanogr.Coll., 8(2):99, fig.42 (Montevideo, Uruguay to Mar del Plata, Argentina).

Synonyms : *Anchovia platana* Marini, 1935:446 (Argentina; nomen nudum); *Anchoa marinii*-Hildebrand & Carvalho, 1948:287 (Rio de Janeiro); Carvalho, 1950a:63, pl.2, fig.8 (compiled); Fusta de Plaza & Boschi, 1961:55 (Mar del Plata); Roux, 1973:52, fig.9 (between Rio de Janeiro and Santos); Weiss & Feijo de Souza, 1977:1 et seq., figs 1-3,5,6 (Buenos Aires, Argentina and Rio Grande do Sul, Brazil; early stages); Figueiredo & Menezes, 1978:31, fig.42 (Cabo Frio to Argentina-compiled); Cervigón, 1980:225, fig.2.75A (Mar del Plata, photo, biol.).

FAO Names : En - Marini's anchovy.



Diagnostic Features : Body somewhat compressed, elongate, its depth about 4.5 to 5 times in standard length. Snout long and pointed, almost equal to eye diameter; maxilla fairly long, tip bluntly pointed, reaching just or almost to hind border of pre-operculum; lower gillrakers 22 to 26; gill cover canals of panamensis- type; pseudobranch long, more than eye diameter, with about 30 filaments. Anal fin moderate, with iii 20 to 24 finrays, its origin below midpoint of dorsal fin base. Anus nearer to anal fin origin than to pelvic fin tips. A narrow silver stripe along flank, about pupil diameter. Atlantic *Anchoa* species that overlap in both gillraker and anal finray counts are: *A. colonensis*, *A. mitchilli* and *A. choerostoma*, which occur to the north of the range, while *A. januaria*, *A. parva* and *A. cubana* (if it reaches so far south) have the anus advanced (nearer to pelvic fin tips) and the pseudobranch short (as also in *A. hepsetus* ; length less than eye and about 20 to 25 filaments); *Anchoa lyolepis* and *A. filifera* have a long pseudobranch, but the anal fin origin is below or behind the last dorsal finray. *Engraulis anchoita* has a shorter maxilla and more gillrakers (38 to 45).

Geographical Distribution : Western South Atlantic (Rio de Janeiro south to Mar del Plata, Argentina; perhaps a little to the north and to the south of this area).

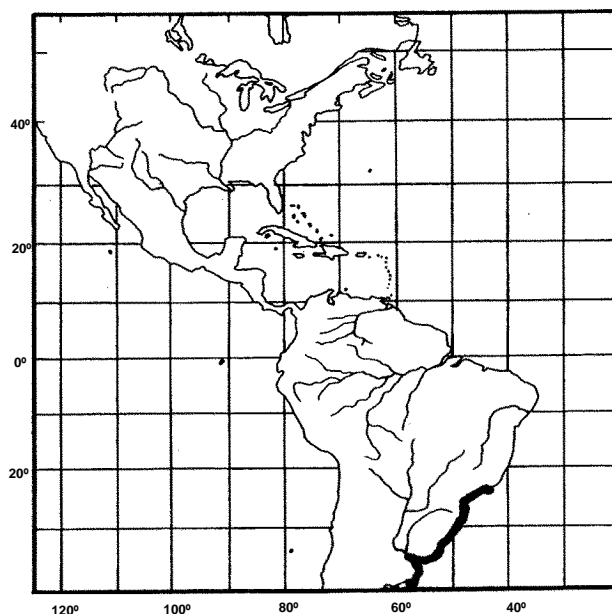
Habitat and Biology : Marine, pelagic, coastal and inshore, caught down to at least 20 m. Presumably feeds on zooplankton. Eggs recorded off Rio Grande do Sul, Brazil, in July and late-August to early September; eggs oval, 0.94 to 1.02 by 0.68 to 0.83 mm (Weiss, Feijó de Souza & Santos, 1976:tab.6); figured by Ciechowski (1968:figs 1-3);

Size : To 8.4 cm standard length.

Interest to Fisheries : No special fishery.

Local Names :

Literature : A number of studies have been made of the eggs and larvae of this species, including those by Ciechowski (1968), Weiss, Feijó de Souza & Santos (1976) and Weiss & Feijó de Souza (1977).



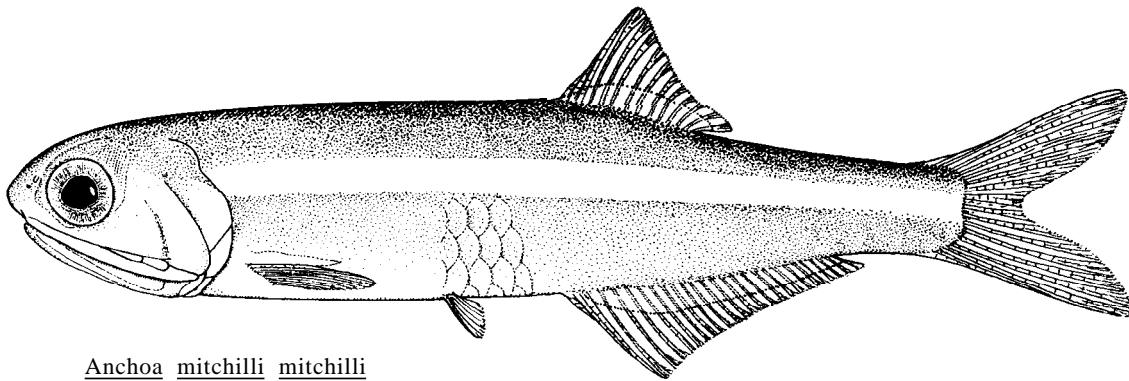
Anchoa mitchilli (Valenciennes, 1848)

ENGR Ancho 3

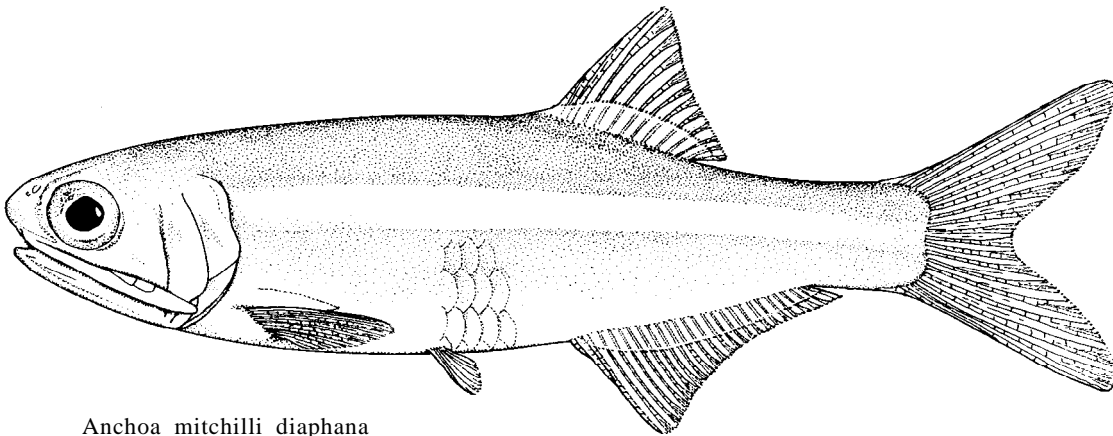
Engraulis mitchilli Valenciennes, 1848, Hist.nat.poiss., 21:50 (New York; also Lac Ponchartrain near New Orleans).

Synonyms : Engraulis louisiana Valenciennes, 1848:51 (on MS description by LeSueur, ex-Lac Pontchartrain near New Orleans; a nomen nudum since published as a synonym); Whitehead, 1967a:129 (louisiana a nomen nudum); Whitehead & Bauchot, 1986:33,48 (same); Anchoa mitchilli diaphana Hildebrand, 1943:91, fig.38 (distinguished from the more northern A. mitchilli mitchilli); Anchoa mitchilli-Hubbs & Hubbs, 1953:figs 1,2 (vertebral variation); FWNA, 1964:178, fig.32 (synopsis); Whitehead 1967a:127 (lectotype of mitchilli); Daly, 1970:85, fig.4 (photo) (Florida); Fineran & Nicol, 1976:296 et seq., figs 1-6 (retinal cones, Texas); Idem., 1977:325 et seq., figs 1-37 (eye pigment epithelium, Texas); Swift, Yerger & Parrish, 1977:22 (Ochlockonee River estuary, Florida).

FAO Names: En -Bay anchovy.



Anchoa mitchilli mitchilli



Anchoa mitchilli diaphana

Diagnostic Features : Body variable, more slender in northern populations, its depth about 4 to 5 times in standard length. Snout fairly blunt, a little over 1/2 eye diameter; maxilla long, tip pointed, reaching beyond hind border of pre-operculum, almost to gill opening; lower gillrakers 21 to 25 (higher part of range in northern populations vide FWNA, 1964:tab.4); gill cover canals of panamensis-type. Anal fin moderate to long, with iii 20 to 27 (rarely 28 finrays, its origin below unbranched dorsal finrays. Anus nearer to pelvic fin tips than to anal fin origin. A narrow silver stripe along flank (broader and almost width of eye in northern populations vide FWNA, 1964:177). Very closely resembles A. cubana, which has the walkeri-type gill cover canals, also not less than 24 gillrakers and not more than 21 branched anal finrays. Other Atlantic Anchoa species that overlap in both gillraker and anal finray counts are A. trinitatis (Trinidad and southern Caribbean), A. hepsetus (branched anal finrays not more than 20; also anus nearer to anal fin origin, as also in A. choerostoma of Bermuda), A. lamprotaenia (gillrakers usually not more than 21, also gill cover canals of walkeri-type, as also in the South and Central American A. januaria and A. parva); A. lyolepis and A. filifera have a long pseudobranch. See Remarks for further distinctions from A. hepsetus. See ENGR Ancho 3, Fishing Area 31.

Geographical Distribution : Western North and Central Atlantic (from Casco Bay in Maine south to Florida Keys and westward around the Gulf of Mexico south to Yucatan; not in the West Indies).

Habitat and Biology : Marine, pelagic, coastal, down to about 36 m, but more commonly in shallow tidal areas with muddy bottoms and brackish waters, tolerating a wide range of salinities (virtually fresh to fully saline or even hypersaline); found only in spring and summer in the tidal portion of the Ochlockonee River, Florida (Swift, Yerger & Parrish, 1977:22). Feeds mostly on *Mysis* and copepods, also small fishes, gastropods and isopods (FWNA, 1964:178). Breeds off North Carolina from late April to mid-July, perhaps through to August' (FWNA, 1964:178).

Size : To about 10 cm standard length.

Interest to Fisheries : No special fishery, but used as a baitfish and to a limited extent to make anchovy paste (FWNA, 1964:178).

Local Names : USA: Bay anchovy (AFS list).

Literature : No comprehensive study of its biology has been made.

Remarks : Daly (1970:tab.3) clearly separated his Florida *A. mitchilli* from *A. hepsetus* on pectoral finray counts (i 9 to 12, usually 10 or 11; cf. i 13 to 16, usually 14 or 15 in *A. hepsetus*); a similar difference, in specimens over the entire range of *A. mitchilli*, is given in FWNA (1964). In addition, the anal fin origin is below the middle of the dorsal fin base in *A. hepsetus* (below unbranched dorsal finrays in *A. mitchilli*).

Hildebrand (1943 and FWNA, 1964) found considerable variation in body depth, width of body, number of lower gillrakers, pectoral fin length, number of vertebrae and width of silver stripe, all of which could be correlated with a northern and a southern form. He considered them subspecies and proposed the name *Anchoa mitchilli diaphana* for the slightly deeper southern form, although admitting that the two intergraded off the Carolinas.

The status of the name *louisiana* (nomen nudum) is explained by Whitehead & Bauchot (1986:48).

Anchoa mitchilli seems to be replaced by *A. parva* in the Caribbean.

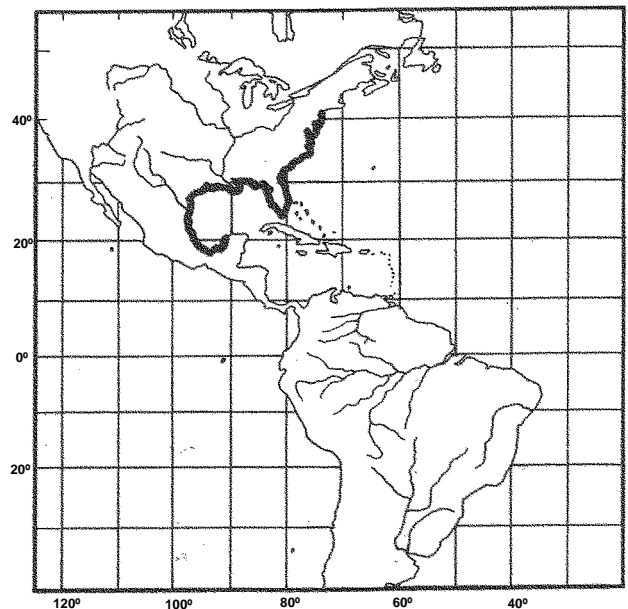
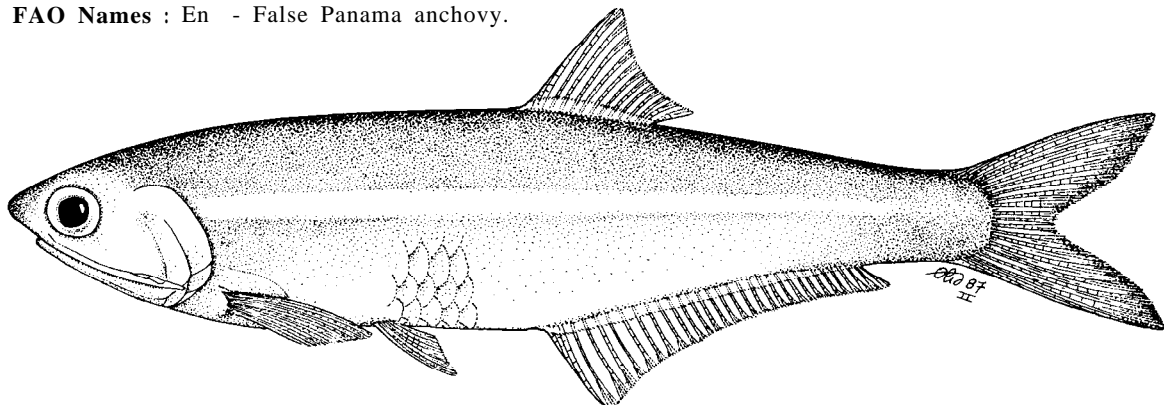
Anchoa mundeola (Gilbert & Pierson, 1898)

ENGR Ancho 19

Stolephorus mundeolus Gilbert & Pierson, in Jordan & Evermann, 1898, *Bull.U.S.natn.Mus.*, (47)(3):2812 (Panama Bay; 3 of the 17 syntypes are *A. walkeri* fide Nelson, 1986).

Synonyms : *Anchoa panamensis* (many or all records to the north of Panama); Peterson, 1956:159 (Gulf of Nicoya); Baldwin & Chang, 1970:139 *et. seq.* (mention only); *Anchoviella mundeola*: Jordan & Seale, 1926:408 (compiled); *Anchoa mundeola*-Nelson, 1983:50 (distinct from *panamensis*, types); Nelson & Sonoda, 1987:521, tabs 1-3 (distinct from *panamensis*, types).

FAO Names : En - False Panama anchovy.



Diagnostic Features : Body compressed, moderately deep. Snout pointed, about 1/2 to 3/4 eye diameter; maxilla moderate, tip somewhat bluntly pointed, reaching to middle of inter-operculum; lower gillrakers 21 to 25 (increasing slightly with body growth); gill cover canals of panamensis-type. Anal fin long, with iii 27 to 33 (mostly 29 or 30) finrays, its origin under anterior rays of dorsal fin (occasionally just in front). A narrow silver stripe along flank, less than eye diameter. Pacific Anchoa species that overlap in both gillraker and anal finray counts are: A. panamensis (Panama Bay only; anal fin origin under or before dorsal fin origin; vertebrae 42 to 44, usually 43, cf. 39 to 41, usually 40 to 41 in A. mundeola) and A. compressa (Pacific coasts of California and Baja California, not in Gulf of California; silver stripe as broad as eye). Other Anchoa species with a long anal fin have not more than 20 gillrakers (rarely 21 in A. mundeoloides).

Geographical Distribution : Eastern central Pacific (Panama Bay north to Sonora, Mexico, i.e. at least the southern half of the Gulf of California).

Habitat and Biology : Probably similar to A. panamensis, with which it has been confused until recently, e.g. by Peterson (1956:161), who noted that in the Gulf of Nicoya, Costa Rica, it occurred only in the northern part where salinities are generally lower.

Size : To 12.5 cm standard length.

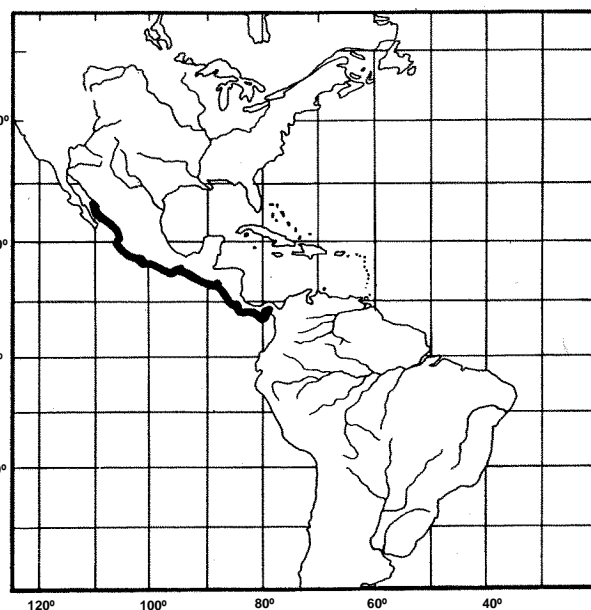
Interest to Fisheries : Unknown.

Local Names :

Literature : Not separated from A. panamensis, but most panamensis records north of Panama Bay will refer to A. mundeola (or perhaps to A. walkeri if the maxilla was long and sharply pointed).

Remarks : Nelson & Sonoda (1987) were able to separate A. mundeola from A. panamensis on only a single trenchant character. Its lower vertebral count (39 to 41 versus 42 to 44), although they found the anal fin origin generally less advanced in A. mundeola. Since the two are apparently sympatric in Panama Bay, one must conclude that they are distinct species. The rather similar A. compressa extends the range northward to California, but seems not to occur with A. mundeola.

In both A. mundeola and A. panamensis (but not in A. compressa) there are small teeth along the upper edge of the hyoid bones, a fairly unusual feature in anchovies-teren raulis and some species of Stolephorus; also, the anus is nearer to the pelvic fin tips than to the anal origin (about equidistant in A. compressa).



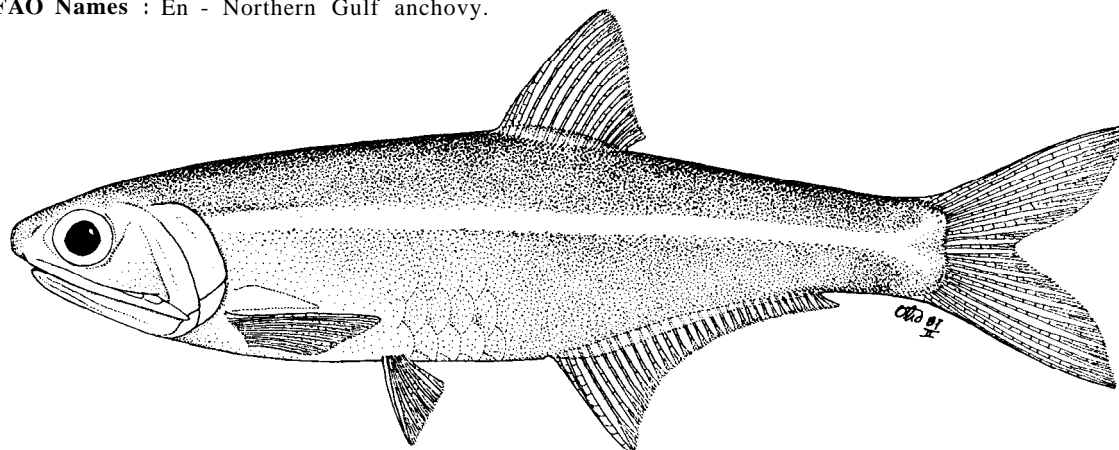
Anchoa mundeoloides (Breder, 1928)

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Anchoa mundeoloides Breder, 1928, Bull. Bingham oceanogr. Coll., 2(2):9, fig.5 (San Filipe Bay, Gulf of California).

Synonyms : Anchoa schultzi Hildebrand, 1943:41, fig.12 (near mouth of Colorado River, northern Gulf of California, also probably San Juan Lagoon); Anchoa mundeoloides-Hildebrand, 1943:45, fig.14 (San Filipe Bay, types; Panama cited, an error); Baldwin & Chang, 1970:142 (Rio Santiago, Nayarit, Mexico); Nelson, 1983:tab. 1 (vertebrae).

FAO Names : En - Northern Gulf anchovy.



Diagnostic Features : Body compressed, moderately deep, its depth about 4 to 4.5 times in standard length. Snout pointed, about 3/4 eye diameter; maxilla moderate, tip somewhat bluntly pointed, reaching just to interoperculum; lower gillrakers 17 to 21; gill cover canals of panamensi-type. Anal fin long, with iii 26 to 31 finrays, its origin under about middle of dorsal fin base. A narrow silver stripe along flank, about width of pupil. Pacific Anchoa species that overlap in both gillraker and anal finray counts are: A. mundeola (not less than 21 gillrakers), A. panamensis (Panama Bay only), A. spinifer (triangular projection on lower edge of gill cover), A. walkeri and A. lucida (walkeri-type canals; also, maxilla tip long and pointed in A. walkeri).

Geographical Distribution : Eastern central Pacific (northern part of Gulf of California only).

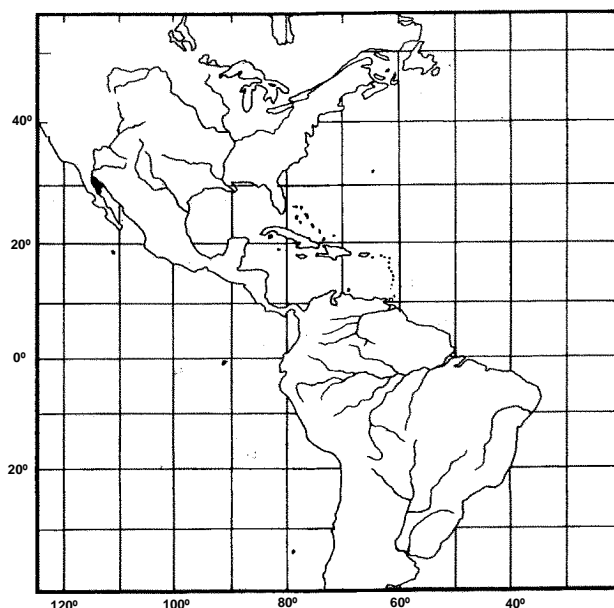
Habitat and Biology : More data needed.

Size : To about 12 cm standard length.

Interest to Fisheries : Probably none.

Local Names : EL SALVADOR, MEXICO: Anchoa

Literature :



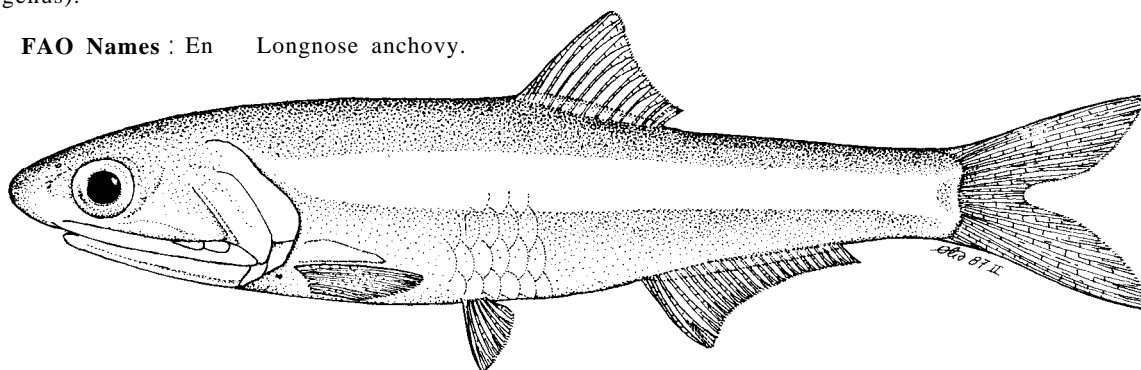
Anchoa nasus (Kner & Steindachner, 1866)

ENGR Ancho 33

Engraulis nasus Kner & Steindachner, 1866, Sber Akad.Wiss.Wein, 54:388, pl.2, fig.17 (Chincha Island, Peru).

Synonyms : Stolephorus naso Gilbert & Pierson, 1898:2813 (Panama Bay); Gilbert & Starks, 1904:43 (Panama); Meek & Hildebrand, 1923:201 (Panama Bay); Anchoa naso:Hildebrand, 1943:100, fig.43 (Panama Bay and Gulf of Guayaquil); Idem, 1946:101, fig.21 (same); Peterson, 1956:170 (Costa Rica); Joseph, 1963:l et seq. (Ecuador, biology); Cobo & Massay, 1969:7, fig.6 (Ecuador, listed); Engraulis peruanus Steindachner, 1880:60 (Callao, Peru); Anchoviella peruana: Jordan & Seale, 1926:401 (Callao, Peru); ? Stolephorus cultratus Gilbert, 189:244 (Santa Margarita Island, Baja California); Jordan & Evermann, 1896:443 (synopsis); Hildebrand, 1943:70, not figured (compiled, type lost); Engraulis nasus:Fowler, 1941a:235 (Peru, listed); Anchoa nasus-Hildebrand, 1943:102, fig.44 (Callao, also Gulf of Guayaquil, Peru); Idem., 1946:103, fig.22 (same); Chirichigno, 1963:18 (Puerto Pizarro, Gulf of Guayaquil); Cobo & Massay, 1969:7, fig.7 (Ecuador, listed); Whitehead,1970:34, p1.3a (nasus, peruana types); Nelson, 1983:tab.1 (vertebrae); Idem., 1986:894, fig.4 (max.), tabs 1-4 (synonymy, subgenus).

FAO Names : En Longnose anchovy.



Diagnostic Features : Body rather round, fairly elongate, its depth about 4 to 5 times in standard length. Snout long, about 3/4 eye diameter or more; maxilla long, tip pointed, reaching almost to gill opening; lower gillrakers 21 to 28 (see Remarks); gill cover canals of panamensis-type; pseudobranch longer than eye diameter, with 30 or more filaments, extending onto inner face of operculum. Anal fin moderate, with iii 20 to 25 finrays, its origin under or just behind base of last dorsal finray. A broad silver stripe along flank, about as wide as eye, faint or absent in fishes over about 10 cm standard length. Of Pacific Anchoa species, only A. starksi has such a long pseudobranch (but branched anal finrays only 16 to 20 and anal fin origin well under dorsal fin base). Engraulis species have many more lower gillrakers (37 to 49).

Geographical Distribution : Eastern Pacific (? Santa Margarita Island, Pacific coast of Baja California - see Remarks; northern Gulf of California at San Juanico Bay southward to Callao, Peru and perhaps further south).

Habitat and Biology : Marine, pelagic, coastal and schooling, entering bays and tolerating some lowering of salinity. No data on food. Spawns throughout year, but more intensively in the warmer months; eggs oval.

Size : To about 13.5 cm standard length (14.0 cm total length vide Hildebrand, 1943).

Interest to Fisheries : The most important tuna baitfish at Manta, Ecuador (Joseph, 1963).

Local Names : COLOMBIA: Anchoa, Mejúa; ECUADOR: Colorado, Pelada; PERU: Anchoa, Anchoveta blanca, Bocona, Chamache, Rubia del Mar, Samasa.

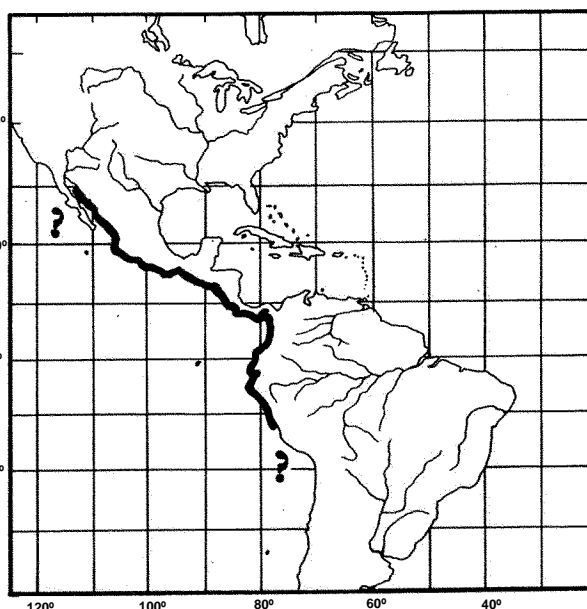
Literature : Peterson (1956 - notes on biology), Joseph (1963 - growth, fecundity, maturity).

Remarks : Hildebrand and others recognised two species, the northern nasus and the southern naso, perhaps best regarded as subspecies:

A. nasus nasus: gillrakers 25 to 28, mostly 26 or 27; vertebrae 40 to 42, mostly 41; Gulf of California south to about Gulf of Guayaquil.

A. nasus naso: gillrakers 21 to 25, mostly 23 or 24; vertebrae 41 to 43, mostly 42; Gulf of Guayaquil south to Callao.

The record of A. nasus from the Pacific coast of Baja California (Santa Margarita Island) is based solely on the now lost type of Stolephorus cultratus. No other species of Anchoa is found both inside and outside the Gulf of California, so perhaps the locality was in error, or it was a specimen of Anchoa delicatissima, A. compressa or even Engraulis mordax.



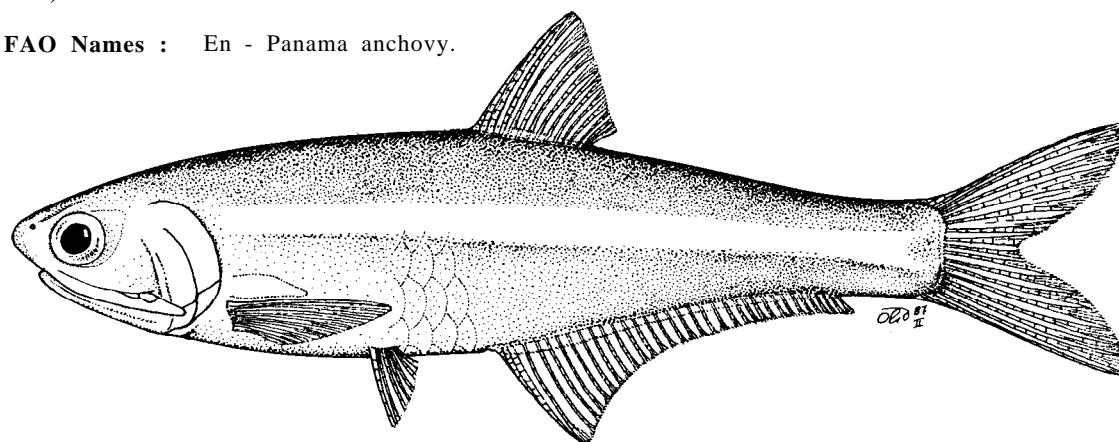
Anchoa panamensis (Steindachner, 1876)

ENGR Ancho 20

Engraulis panamensis Steindachner, 1876, Sber.Akad.Wiss.Wien, 72:589 (Panama); Idem, 1876, Ichthyol.Beitr (4):39 (repeat).

Synonyms : Anchovia panamensis: Gilbert & Starks., 1904:44 (Panama); Meek & Hildebrand, 1923:2137, p1.15, fig.1 (Panama Bay); Anchoa panamensis-Hildebrand, 1943:43, fig.13 (Panama Bay specimens only; those to the north are A. mundeola, that from Peru unknown); Anchoa panamensis-Whitehead, 1970:36 (lectotype); Nelson, 1983:50, fig.1 (gill cover canals), tab.1 (vertebrae); Nelson & Sonoda, 1987:521, tabs 1-3 (meristics), fig.1 (gillrakers).

FAO Names : En - Panama anchovy.



Diagnostic Features : Body compressed, moderately deep. Snout pointed, about 1/2 to 3/4 eye diameter; maxilla moderate, tip somewhat bluntly pointed, reaching to middle of inter-operculum; lower gillrakers 19 to 24 (increasing slightly with body size); gill cover canals of panamensis-type. Anal fin long, with iii 28 to 35 (mostly 31 to 33) finrays, its origin under or slightly before dorsal fin origin. A narrow silver stripe along flank, about pupil diameter. Pacific Anchoa species that overlap in both gillraker and anal finray counts are: A. mundeola (extends north of Panama Bay; anal fin origin usually before dorsal fin origin; vertebrae 39 to 41, cf. 42 to 44 in A. panamensis) and A. compressa (not south of Baja California; silver stripe as broad as eye). Occasional specimens of A. lucida have 28 branched anal finrays and overlap in gillraker counts, but gill cover canals of walkeri-type. Other Anchoa species with a long anal fin have not more than 20 gillrakers (rarely 21 in A. mundeoloides).

Geographical Distribution : Eastern central Pacific (Panama Bay only).

Habitat and Biology : Marine, coastal, pelagic, probably tolerating lowered salinities (as in A. mundeola). More data needed (that given by Warburton, 1978, 1979, refers to Anchoviella analis).

Size : To 12.5 cm standard length.

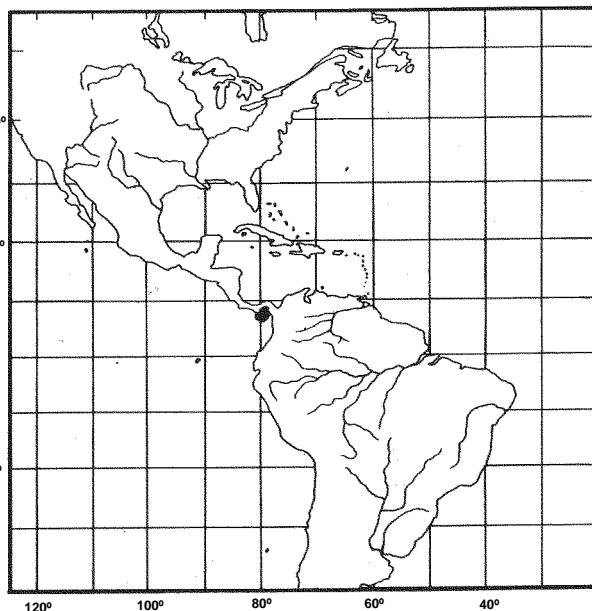
Interest to Fisheries : No data.

Local Names : COLOMBIA, COSTA RICA: Anchoa; ECUADOR: Chiminia; MEXICO: Anchoa; PANAMA: Anchoa, Anchoveta; PERU: Anchoa del Norte.

Literature :

Remarks : See under A. mundeola for comments on hyoid teeth and relationships.

The possible southward extension of the range of A. panamensis is unknown, but the Peruvian records of Hildebrand (1946:99) and Chirichigno (1963:17, fig.9) could equally apply to A. spinifer or even to a southward extension of A. walkeri, both of which have the rather long and pointed maxilla noted by Hildebrand (shorter and blunter in A. panamensis). The Ecuador record (listing) by Cobo & Massay (1969:8) is doubtful, although A. spinifer was also listed and the figure appears to be that species; perhaps the specimens of panamensis were walkeri.



Anchoa parva (Meek & Hildebrand, 1923)

ENGR Ancho 4

Anchoa parva Meek & Hildebrand, 1923, Field Mus.Publ.Zool.,15(1):202, p1.10, fig.2 (Porto Bello, Panama).

Synonyms : Anchoa parva-Hildebrand, 1943:83, fig.35 (Cuba, Jamaica, Panama, Venezuela); Schultz, 1949:43 (Lake Maracaibo); FWNA, 1964:181, fig.33 (also Trinidad; synopsis); Cervigón, 1966:141 (on Schultz, 1949); Idem., 1969:221, fig.8 (Puerto Rico, Margarita Island off Venezuela, Panama,also Fortaleza, Brazil); Dahl, 1971:163, fig.201 (Colombia); Whitehead, 1973a:125, fig.49, also 48 (maxilla) (Trinidad); Perez et al., 1975:228 et seq., figs 1-4 (electrophoretograms), tab.1 (analysis of proteins, relationships, Venezuela).

FAO Names: En - Little anchovy.

