

Diagnostic Features : Body slender, elongate, rather round in cross-section, belly rounded, with 5 or 6 small needle-like pre-pelvic scutes. Maxilla tip pointed, reaching about halfway across pre-operculum; hind border of pre-operculum convex, rounded. Lower gillrakers 25. Isthmus muscle tapering evenly forward to hind border of branchial membrane; pseudobranch longer than eye, reaching onto inner face of operculum; toothplates fused to epibranchial. Pelvic fin tips just reaching to dorsal fin origin; anal fin short, with iii 16 to 18 finrays, its origin below final third of dorsal fin base. A silver stripe along flank. Strongly resembles *S. indicus* in body form, but the latter has a shorter maxilla (to front margin of pre-operculum), shorter pseudobranch (not onto operculum) and shorter pelvic fins (well short of dorsal fin origin). Other *Stolephorus* species with a rounded pre-operculum and pelvic fins reaching to dorsal fin origin are: *S. commersonii* scutes usually only 2 or 3; also, no epibranchial toothplates), *S. brachycephalus* (only 20 to 22 gillrakers) and *S. apiensis* (gillrakers not less than 27).

Geographical Distribution : Western central Pacific (a little south of Cooktown, Queensland, Australia).

Habitat and Biology : Presumed coastal, pelagic and schooling; more material and data needed. Known from three specimens taken at 9 m depth by prawn trawl.

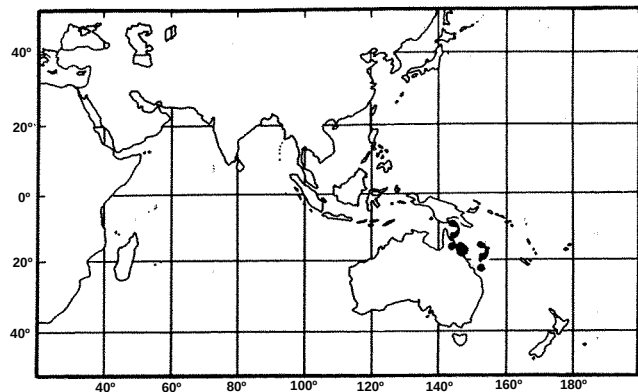
Size : To 10 cm standard length.

Interest to Fisheries : Nil.

Local Names :

Literature :

Remarks : The long pseudobranch and fused epibranchial toothplates are characters otherwise found in *Encrasicholina*.

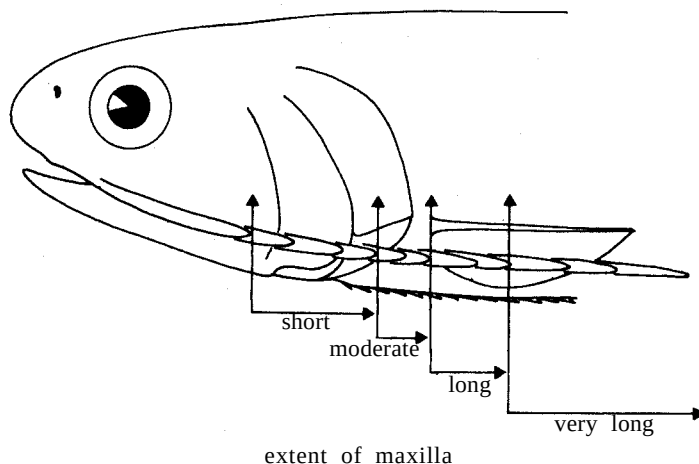


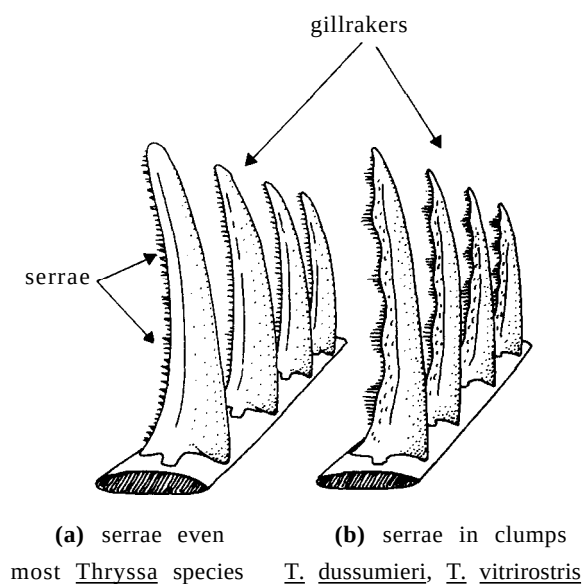
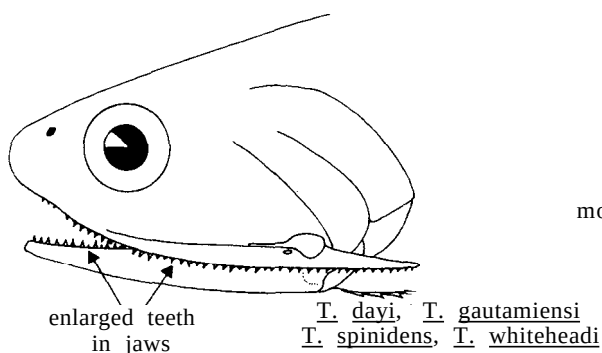
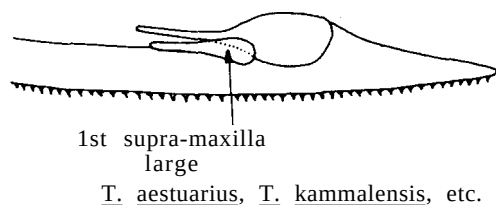
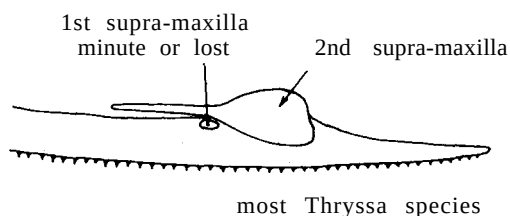
Thryssa Cuvier, 1829

ENGR Thrys

Thryssa Cuvier, 1816, *Regne anim.*, 1st ed., 2:176 (type: *Clupea mystus* Linnaeus, 1758 = *Coilia mystus*, designated by Bory St Vincent, 1823:231 - overlooked except by Whitley, 1935; *Clupea setirostris* Broussonet, 1782 designated by Jordan & Evermann, 1917:98 - not *Thryssa* Rafinesque, 1815, which pre-dated Cuvier's name and applies to *Clupanodon*, but is a *nomen nudum*; see, discussion in Whitehead, 1967a:141). *Thryssa* Cuvier, 1829, *Règne anim.*, 2nd ed., 2:323 (type: *Clupea setirostris* Broussonet, 1782, since *Thryssa* an (unjustified) emendation for *Thryssa*). *Thryssus* Swainson, 1838, *Nat.hist.anim.*, 1:279,280 (type: *Clupea setirostris* Broussonet, 1782). *Trichosoma* Swainson, 1839, *Ibid.*, 2:292 (type: *Thryssa hamiltonii* Gray, 1835). *Thrissocles* Jordan & Evermann, 1917, *Genera of fishes*, (1):98 (type: *Clupea setirostris* Broussonet, 1782, since *Thrissocles* a replacement name for *Thryssa*). *Xenengraulis* Jordan & Seale, 1925, *Copeia*, (141):29 (type: *Xenengraulis spinidens* Jordan & Seale, 1925). *Scutengraulis* Jordan & Seale, 1925, *Ibid.*:30 (type: *Clupea hamiltonii* Gray, 1835), *Thrissina* Jordan & Seale, 1925, *Ibid.*:30 (type: *Clupea baelama* Forsskal, 1775).

Diagnostic Features : Medium-sized compressed or strongly compressed anchovies (mostly to about 8 to 14 cm standard length, but *T. scratchleyi* to 37 cm), the belly fairly sharply keeled, with 21 to 32 scutes from isthmus to anus (absent before pectoral fin base or only 1 or 2 in two species); a small spine-like scute just before dorsal fin origin. Maxilla tip pointed, reaching beyond front border of pre-operculum, often to gill opening, sometimes to pectoral fin base or beyond (to pelvic fin base or beyond in *T. setirostris*); jaw teeth usually small, a little enlarged in some species. Gillrakers stout or slender, 11 to 32 in most species (but to 61 in *T. rastrosa*). Anal fin long, usually with 25 to 45 branched finrays, its origin usually behind base of last dorsal finray.





Scales moderate, usually 34 to 46 in lateral series. In most species the branches of the cephalic lateralis sensory canal bear black pigment, forming a distinct blotch behind the upper part of the gill opening; dorsal and caudal fins are often yellow, with dark tips or margins.

Biology, Habitat and Distribution : Marine, pelagic and probably always schooling fishes, although perhaps not forming very large schools; mostly inshore, along beaches and entering river mouths; some temporary or even permanent residents in rivers. Indo-West Pacific only, from western shores of Indian Ocean eastward to Papua New Guinea (exceptionally to the New Herbrides or even Tonga).

Species : In the most recent revision, Wongratana (1980) recognized 21 species, placed in three subgenera; Nelson (1983) recognized another species, as also Wongratana (1987a), who also described a new one (total 24 species):

Subgenus *Thryssa* (maxilla to beyond pectoral fin tip)

T. setirostris (Broussonet, 1782) Widespread, Indo-West Pacific

Subgenus *Thrissina* (only 4 to 9 pre-pelvic scutes)

T. baelama (Forsskal, 1775) Widespread, Indo-West Pacific

T. encrasicoloides (Bleeker, 1852) Less widespread, Indo-West Pacific

Subgenus *Scutengraulis*

Widespread

T. hamiltonii (Gray, 1835) Arabian Sea to Taiwan Island and Australia

T. dussumieri (Valenciennes, 1848) Arabian Sea to Taiwan Island

T. mystax (Schneider, 1801) India to Indonesia

Indian Ocean

T. dayi Wongratana, 1983 West coasts of India

T. gautamiensis Babu Rao, 1970 East coasts of India

T. kammalensoides Wongratana, 1983 East coasts of India

T. malabarica (Bloch, 1795) India

T. polibranchialis Wongratana, 1983 India

T. purava (Hamilton-Buchanan, 1822) India

T. spinidens Jordan & Seale, 1925 Bay of Bengal

T. stenosoma Wongratana, 1983 East coasts of India

T. whiteheadi Wongratana, 1983 the "Gulf"

T. vitrirostris (Gilchrist & Thompson, 1908) Southern Africa to India

West Pacific

- T. adelae (Rutter, 1897) China
T. aestuaria (Ogilby, 1911) Papua New Guinea and Australia
T. brevicauda Roberts, 1978 Papua New Guinea
T. chefuensis (Günther, 1874) China
T. kammalensis (Bleeker, 1849) Indonesia
T. marasriae Wongratana, 1987 Northern Australia
T. rastrosa Roberts, 1978 Papua New Guinea
T. scratchleyi (Ramsey & Ogilby, 1886) Papua New Guinea, Australia

Remarks : Until the revision by Wongratana (1980), virtually all recent authors have placed baelama in the genus Thrissina because of its lack of a full complement of pre-pectoral scutes (also, its short maxilla, rather low anal finray count of (usually) iii 26 to 29, and not strongly compressed body); Thrissina appeared to be intermediate between Stolephorus and Thryssa.

The placing of setirostris in a separate subgenus seems justified; the very long maxilla, although striking, merely continues the trend leading to T. dussumieri, but setirostris differs from all other Thryssa species in having a very high coronoid process, the lower jaw rising steeply in the mouth (Wongratana, 1980:pl. 261d).

The identification of species of Thryssa is still very difficult, even using such a thorough key as that given by Wongratana (1980:70-6). To simplify comparisons, distinctions are only given for species actually or likely to be found in the same area. Thereafter, major separations are made between species with short, medium, long or very long maxillae (not to gill cover, just beyond it, to pectoral fin base, or well beyond it); between those with or without a first supra-maxilla; and between those with the tip of the snout distinctly above the midline of the eye. Numbers of gillrakers and anal finrays also help in identification, as also the enlargement of the jaw teeth.

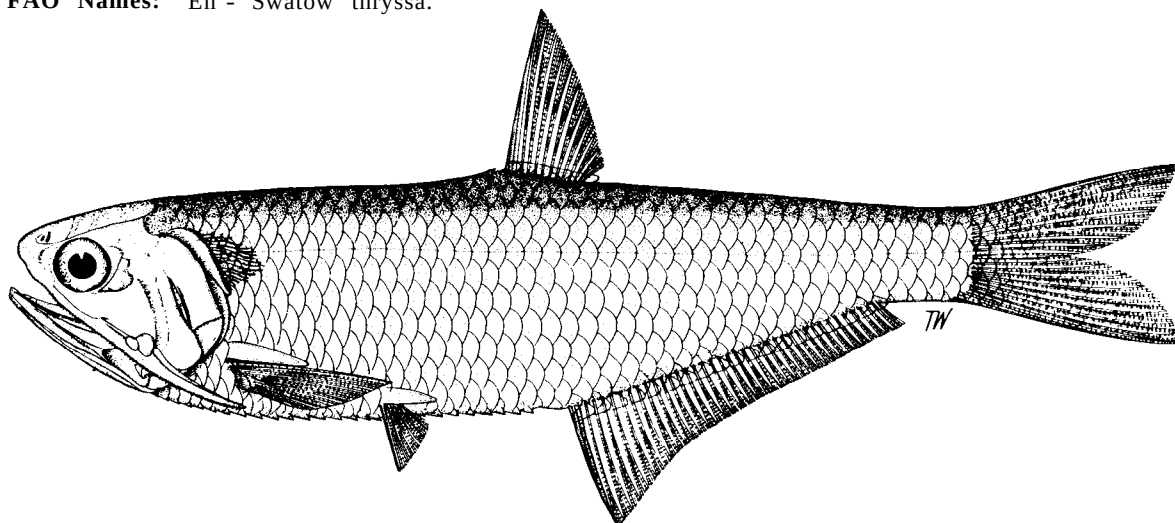
Thryssa adelae (Rutter, 1897)

ENGR Thrys 14

Trichosoma adelae Rutter, 1897, Proc.Acad.nat.Sci.Philad. : 65 (Swatow).

Synonyms : Setipinna adelae:Fowler, 1931a:80 (on Rutter); Thryssa adelae-Wongratana, 1980:272, pl. 238 (revision).

FAO Names: En - Swatow thryssa.



Diagnostic Features : Body compressed, belly with 17 (rarely 18) plus 9 (rarely 10 or 11) =26 or 27 (rarely 28) keeled scutes from isthmus to anus. Maxilla long, reaching beyond base of first pectoral finray; first supra-maxilla small, oval. Lower gillrakers 20 to 22. Anal fin with iii (rarely iv) 34 to 41 finrays. A dark blotch behind upper part of gill opening. Of species found in Chinese waters, T. chefuensis has a short maxilla (tip not reaching beyond gill cover; also, 27 to 30 gillrakers), while T. dussumieri and T. setirostris have much longer maxillae (to at least midpoint of pectoral fin); T. hamiltonii has fewer gillrakers (only 11 to 15).

Geographical Distribution : West Pacific (Taiwan Island and northern waters of China, but exact northern extent not known).

Habitat and Biology : Marine, pelagic, presumably schooling, perhaps mainly in inshore waters. More data needed, based on correct identifications.

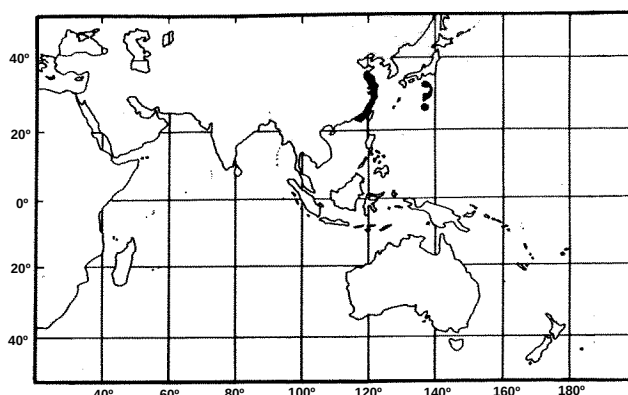
Size : To 11 cm standard length, perhaps more.

Interest to Fisheries : Presumably contributes to artisanal fisheries, but extent unknown.

Local Names :

Literature :

Remarks : The species is probably hidden in various synonymies, chiefly those of hamiltonii, which it resembles superficially.



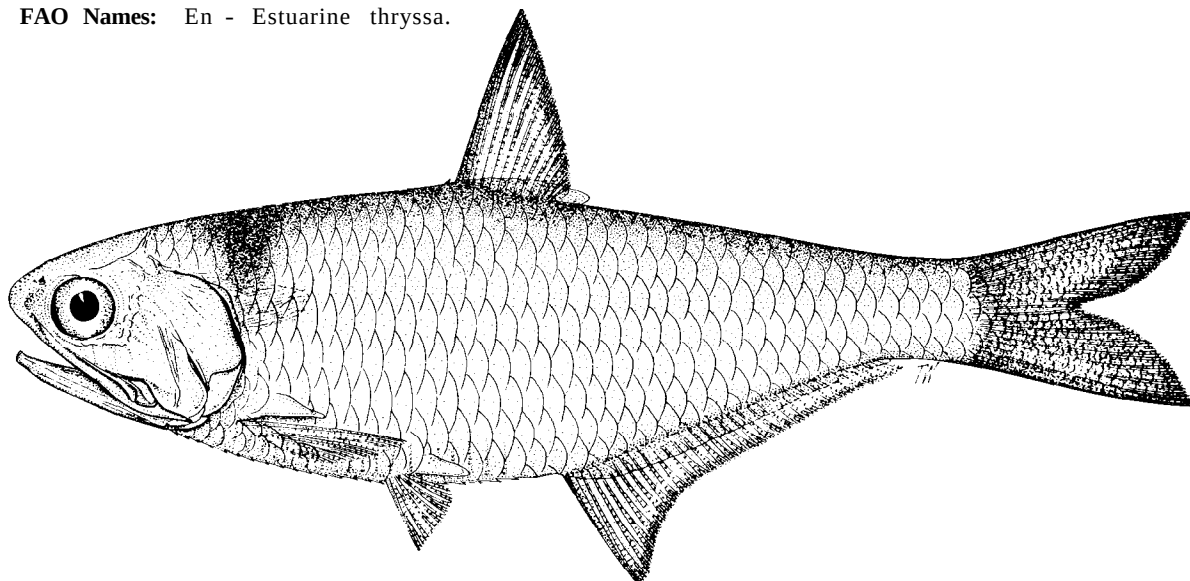
Thryssa aestuaria (Ogilby, 1911)

ENGR Thrys 10

Anchovia aestuaria Ogilby, 1911, Proc.R.Soc.Qd., 23(1):4 (Brisbane River, Queensland, Australia).

Synonyms : ? Thrissina aestuaria:Munro, 1956:27, fig.187 (but scutes only 5 plus 8); Thryssa aestuaria: Wongratana, 1980:265 (Brisbane River, Queensland; part only, the figures and some of description based on T. brevicauda).

FAO Names: En - Estuarine thryssa.



Diagnostic Features : Body fairly compressed, belly with 14 to 16 plus 8 or 9 = 22 to 25 keeled scutes from isthmus to anus. Maxilla short, reaching to hind border of pre-operculum; first supra-maxilla short, about half length of second. Lower gillrakers 26 to 29; pseudobranch very short. Anal finrays iii to iv 30 to 34. A diffuse dark saddle on nape; no dark blotch behind gill opening. Closely resembles T. brevicauda (very long pseudobranch) and T. marasriae (saddle blotch near to dorsal fin origin, branched anal finrays 26 to 28); of other species in the area, neither T. rastrosa (gillrakers 55 to 61) and T. scratchleyi (gillrakers 18 to 22) nor T. hamiltonii (maxilla to gill opening) have a dark saddle on back. Species of Setipinna have a filamentous first pectoral finray, while Papuengraulis has a tiny dorsal fin (5 or 6 finrays).

Geographical Distribution : Australia (northern coasts from Onslow east to Gulf of Carpentaria; and eastern coasts from Brisbane south to 30° S; but presumably to the north also).

Habitat and Biology : Presumed marine, pelagic, coastal, but also estuarine, thus tolerating lowered salinities. More data needed.

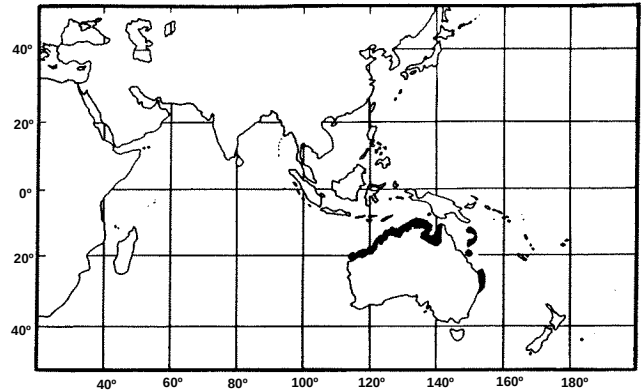
Size : To 13.8 cm standard length.

Interest to Fisheries : Probably little.

Local Names :

Literature :

Remarks : See under T. brevicauda for further separation of these two species.



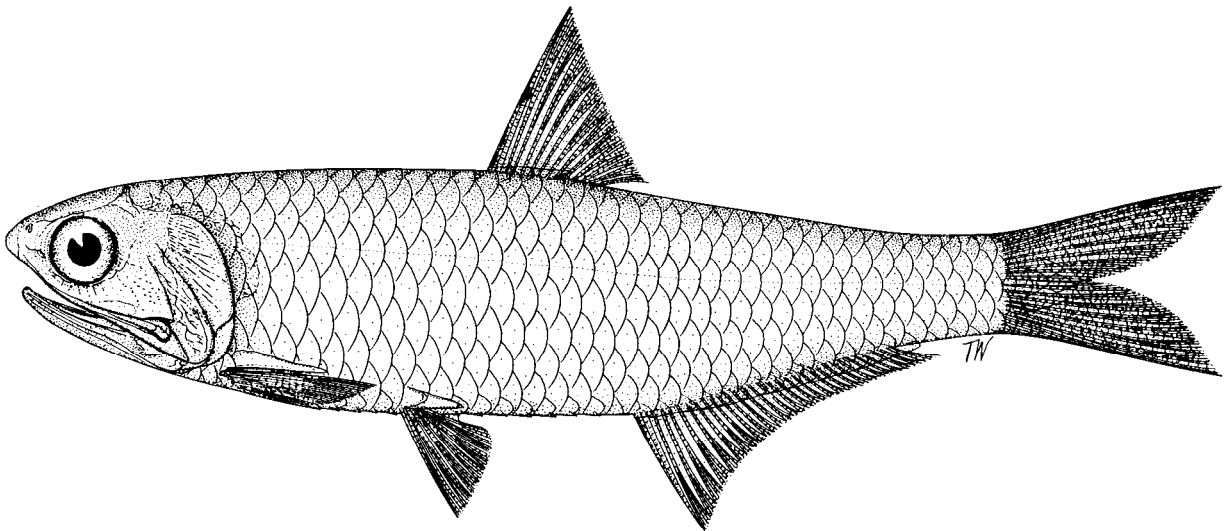
Thyryssa baelama (Forsskål, 1775)

ENGR Thrys 6

Clupea baelama Forsskål, 1775, Descript. anim.:72 (Djidda, Red Sea).

Synonyms : Clupea tuberculosa Lacepède, 1803, Hist. nat. poiss., 5:425, 460 (on Commerson's description, Mauritius); Engraulis nesogallicus Bennett, 1832:162 (Mauritius; perhaps this species); Engraulis samam Montrouzier, 1857:209 (Woodlark Island or Moiou); Engraulis polynemoides Günther, 1868:394 (Madagascar); Anchovia apiensis evermanni Jordan & Seale, 1906:188, fig. 4 (Apia, Samoa); Engraulis macrops Kishinouye, 1911:385, fig. 3 (as micropus) (Hahajima, Bonin Islands); Thrissina aestuaria: Munro, 1956:27, fig. 187 (southern Queensland, northern New South Wales; not Anchovia aestuaria Ogilby = Thyryssa aestuaria). Thrissocles baelama: Fowler, 1941d:683 (the Philippines, Mauritius; large synonymy); Thrissina baelama: Whitehead, 1965b:271 (Red Sea); Idem, 1967a:140 (basis for tuberculosa of Lacepède); Losse, 1968:110 (East Africa); Kami, Idehara & DeLeon, 1968:96 (Guam); Whitehead, 1973b:227, fig. 52 (synopsis); Lewis, Smith & Ellway, 1983:18 (New Guinea to Tonga); Thyryssa baelama-Wongratana, 1980:258, pls 223, 224 (revision).

FAO Names : En - Baelama anchovy.



Diagnostic Features : Body not strongly compressed, belly rounded before pelvic fins, with 4 to 9 (usually 5 to 7, mostly 6) plus 7 to 10 (usually 9) = 12 to 18 (usually 14 to 17) keeled scutes, the pre-pelvic scutes ending below the pectoral fin base or behind it. Maxilla short, reaching to just beyond front border of pre-operculum, tip pointed. Gillrakers 18 to 26 (mostly 20 to 24). Closely resembles T. encrasicholoides, which has 1 or 2 small but armless keeled scutes immediately behind the isthmus; also, maxilla tip blunter. Other species of Thyryssa have a complete series of pre-pelvic scutes from isthmus to pelvic fin base; Stolephorus species lack post-pelvic scutes; Lycorhissa has canine teeth. See ENGR Thrys 6, Fishing Area 51, also ENGR Thris 1, Fishing Areas 57/71.

Geographical Distribution : Widespread in Indian Ocean (perhaps the "Gulf", certainly the Red Sea, coasts of East Africa to Madagascar and Mauritius; also Sri Lanka, Andaman Islands, but no Indian specimens), and in western central Pacific (Indonesia, the Philippines, Papua New Guinea, northern and eastern coasts of Australia, eastward to Tonga; no records from South China Sea or to the north, but the Ogasawara (Bonin Islands) record of Kishinouye (1911 - as Engraulis macropus) seems reliable.

Habitat and Biology : Marine, pelagic, presumably schooling, mostly inshore in bays, lagoons, harbours, mangrove pools and estuaries, thus apparently able to tolerate lowered salinities. More data needed.

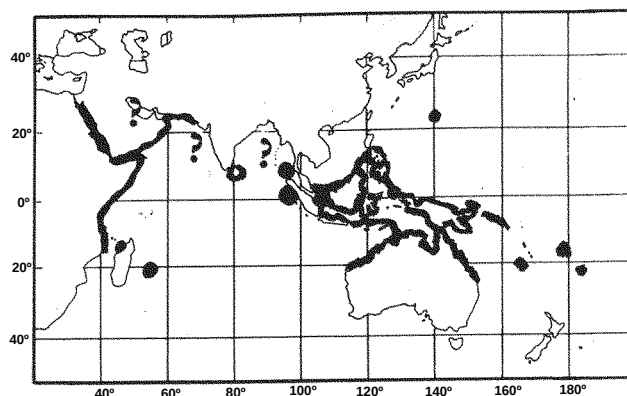
Size : To 10.8 cm standard length.

Interest to Fisheries : Contributes to general clupeoid catches, but no special fishery. Used as a baitfish in the Pacific; does not lose its scales easily, thus more hardy than Stolephorus species.

Local Names : INDONESIA: Kendui (Madura), Ligoh, Merah (Batjan), Lompeh (Manado), Lungrah (Saparua), Puri merah (Ambon), Teri (Malay at Jakarta), Tjangkok (Sundanese); JAPAN: Ainoko iwashi or "half-caste sardine" (by bait fishermen). The Indonesian names are taken from Weber & de Beaufort (1913:34); most of them are general words used for small anchovies.

Literature : Sadasivan (1965 - notes on biology), Marichamy (1970 - abnormalities), Lewis, Smith & Ellway (1983 - suitability as baitfish).

Remarks : Since T. encrasicholoides was included in E. baelama by most authors until separated by Nelson (1983), some of the previous distributional and other data must be questioned.



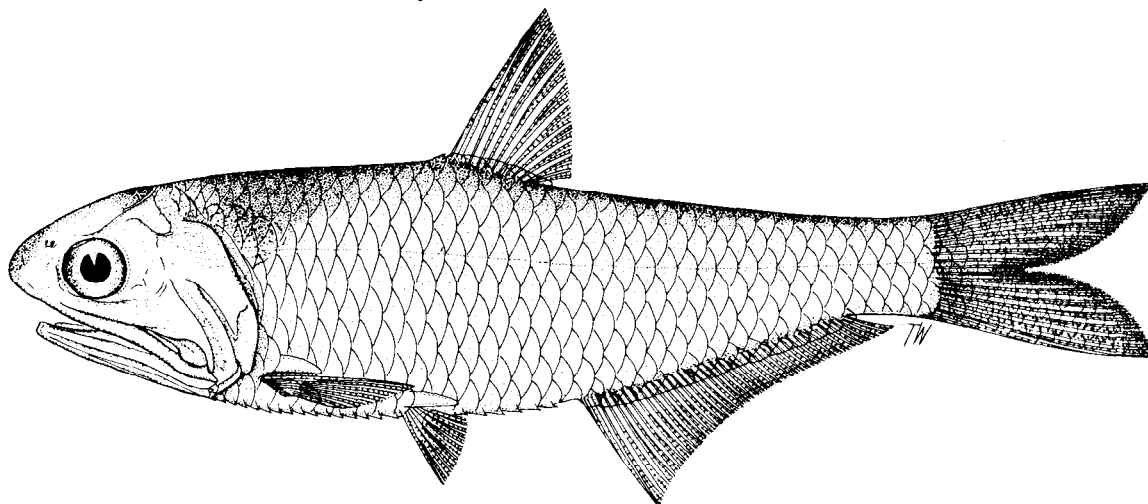
Thryssa brevicauda Roberts, 1978

ENGR Thrys 23

Thryssa brevicauda Roberts, 1978, Smithson.Contr.Zool., (281):29, fig.10c (mangrove creek, lower Fly River, Papua New Guinea).

Synonyms : Thryssa aestuaria: Wongratana, 1980:265, pls 231, 232 (brevicauda element only; on which the drawings were based).

FAO Names : En - Short-tail thryssa.



Diagnostic Features : Body fairly compressed, belly with 14 to 16 plus 9 = 23 to 25 keeled scutes from isthmus to anus. Maxilla short, reaching to hind border of pre-operculum; first supra-maxilla short, about half length of second. Lower gillrakers 27; pseudobranch long. Anal finrays iii to iv 29 to 32. A diffuse dark saddle on nape; no dark blotch behind gill opening. Closely resembles T. aestuaria (very short pseudobranch) and T. marasriae (saddle blotch near to dorsal fin origin, branched anal finrays 26 to 28); of other species in the area, neither T. rastrosa (gillrakers 55 to 61) and T. scratchleyi (gillrakers 18 to 20), nor T. hamiltonii (maxilla to gill opening) have a dark saddle on the back. Species of Setioinna have a filamentous first pectoral finray, while Papuengraulis has a tiny dorsal fin (5 or 6 finrays).

Geographical Distribution : Papua New Guinea (Fly River) and northern Australia (near Darwin).

Habitat and Biology : Presumed marine, pelagic, coastal, but at least the juveniles entering mangrove creeks of rivers, thus tolerating lowered salinities. More data needed.

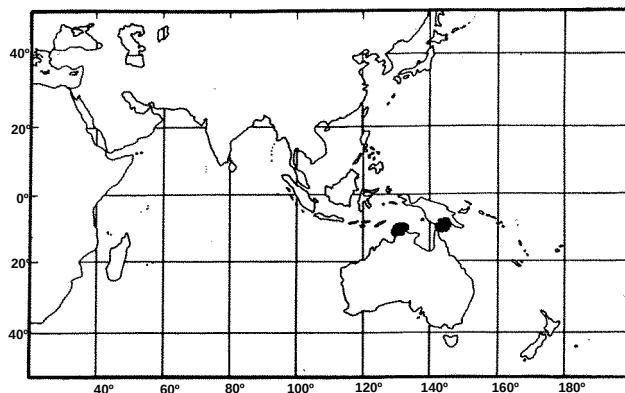
Size : To 7.5 cm standard length, but presumably bigger.

Interest to Fisheries : Probably little.

Local Names :

Literature :

Remarks : Very close to T. aestuaria, with which it occurs in northern Australia. It also differs from that species in having fewer scales (34 to 35 in lateral series; cf. 37 to 38) and the striae on the scales forming a reticulate pattern (cf. regular vertical striae in T. aestuaria, as also in the closely related T. marasriae).



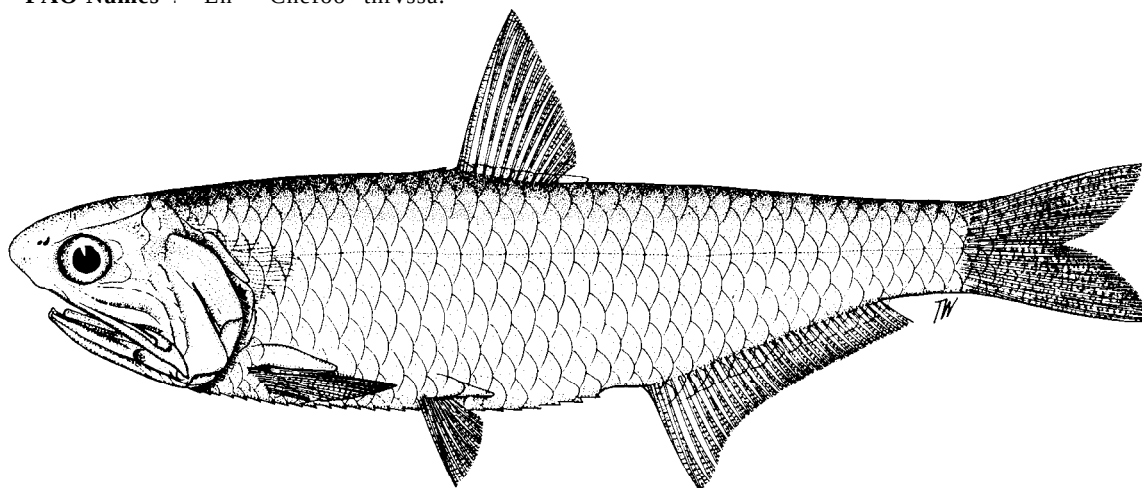
Thryssa chefuensis (Günther, 1874)

ENGR Thrys 8

Engraulis chefuensis Günther, 1874, Ann.Mag.nat.Hist., (4)13:158 (Chefoo, China).

Synonyms : ? Engraulis koreanus Kishinouye, 1907:101, pls 20, fig.2 and 21, fig.6 (Kinshu Peninsula, South Korea; types lost, possibly could be T. hamiltonii); ? Thryssa kammalensis:Shen, 1959:26 (Taiwan; maxilla short, gillrakers 28 to 32); Thryssa chefuensis -Wongratana, 1980:262, pls 225,226 (revision).

FAO Names : En - Chefoo thrvssa.



Diagnostic Features : Body compressed, belly with 16 to 18 plus 9 or 10 = 25 to 28 keeled scutes from isthmus to anus. Maxilla short, not reaching back beyond hind border of pre-operculum; first supra-maxilla long, at least half length of second. Lower gillrakers 27 to 30, the serrae not distinctly clumped. Anal finrays iii 25 to 31. Of species found in Chinese waters, T. hamiltonii, T. adae, T. dussumieri and T. setirostris all have a longer maxilla (beyond or well beyond gill opening). Species of Setipinna have a filamentous first pectoral finray.

Geographical Distribution : Western Pacific (Hong Kong to Korea).

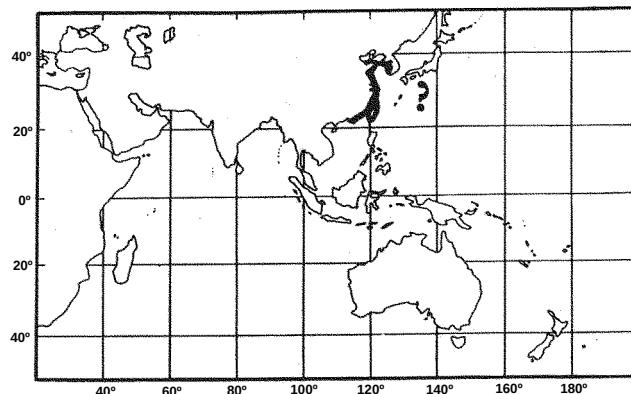
Habitat and Biology : Presumably marine, pelagic and schooling, but more data needed (based on correct identifications).

Size : To 10.7 cm standard length.

Interest to Fisheries : Unknown.

Local Names :

Literature : Not recorded by Chu, Tchang & Chen (1963) for the East China Sea, but perhaps mixed with T. hamiltonii.



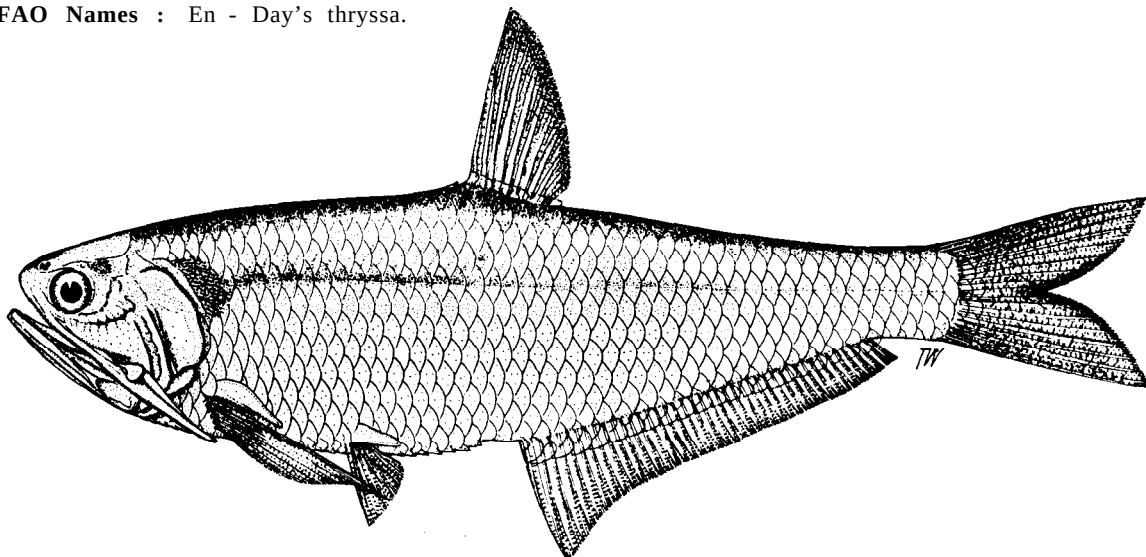
Thryssa dayi Wongratana, 1983

ENGR Thrys 20

Thryssa (Scutengraulis) dayi Wongratana, 1983, Japan J. Ichthyol., 29(4):404, fig.24 (Bombay, Karachi).

Synonyms : Thryssa purava or T. mystax: perhaps identified as such by earlier authors; Thryssa dayi: Wongratana, 1980:290, pls 257,258 (revision; name not validly published).

FAO Names : En - Day's thryssa.



Diagnostic Features : Body compressed, belly with 15 or 16 plus 10 or 11 = 25 to 27 keeled scutes from isthmus to anus. Tip of snout a little above level of eye centre, nearly to upper rim of eye. Maxilla long, reaching to pectoral fin base; first supra-maxilla minute, oval; teeth in jaws enlarged, especially in lower jaw. Gillrakers 14 to 18. Tip of first pectoral finray elongated into a short filament (about equal to eye diameter) in some specimens; anal fin rays iii 41 to 46 (mostly 42 to 44). A dark blotch indistinct or absent behind upper part of gill opening; gill arches pinky orange, basibranchials black, inside of gill cover pale yellow or golden; a pair of dark lines along back. Of Arabian Sea species with a long maxilla (to pectoral fin base), T. mystax and T. vitrirostris have not more than 40 (usually not more than 35 and 38) branched anal finrays; T. purava has a shorter maxilla (not to base of pectoral fin), but otherwise overlaps T. dayi in many characters. In no other species of Thryssa is the first pectoral finray filamentous (cf. Setipinna, where the filament is usually at least half the fin length).

Geographical Distribution : Indian Ocean (entire western coast of India north to Pakistan, possibly to Gulf of Oman).

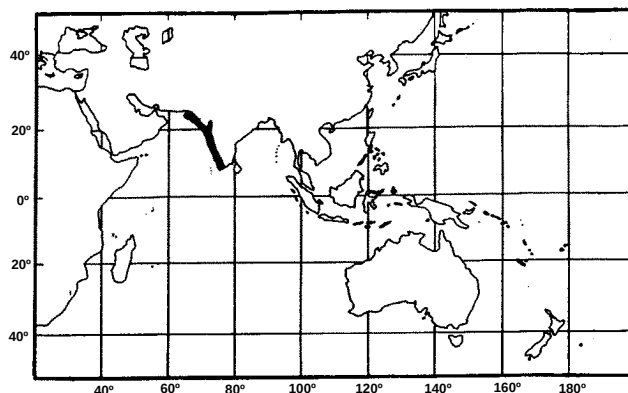
Habitat and Biology : Marine, pelagic, presumably schooling and inshore. More data needed.

Size : To 21.5 cm standard length.

Interest to Fisheries : Unknown.

Local Names :

Literature :



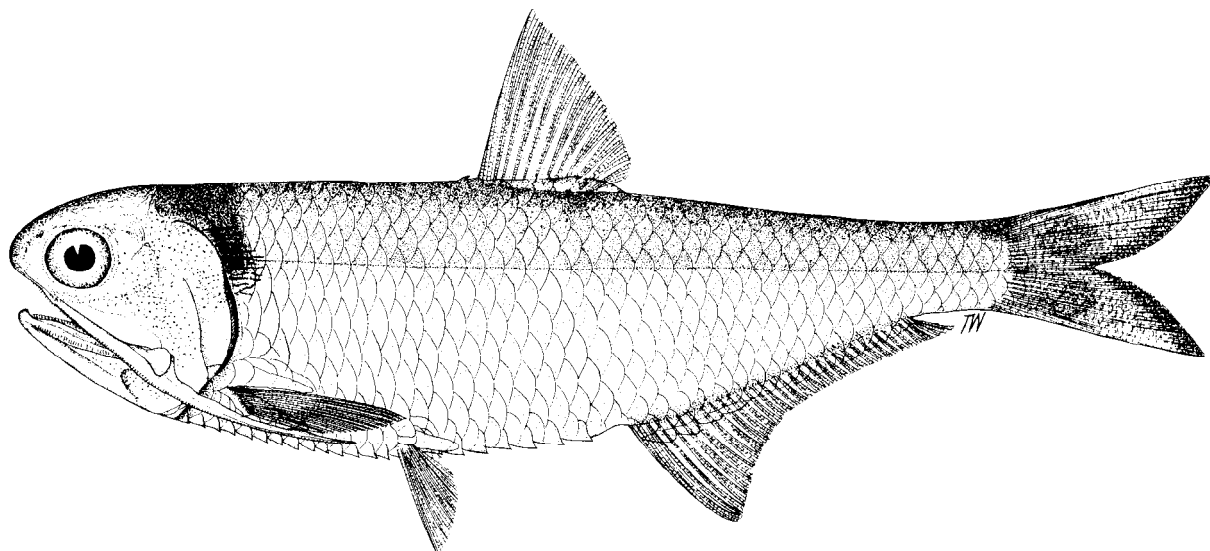
Thryssa dussumieri (Valenciennes, 1848)

ENGR Thrys 7

Engraulis dussumieri Valenciennes, 1848, *Hist.nat.poiss.*, 21:69 (no locality).

Synonyms : *Engraulis auratus* Day, 1865:312 (Cochin, India); Whitehead & Talwar, 1976:118-119, 121, No. 15 (*auratus* types); *Engraulis dussumieri*:Weber & de Beaufort, 1913:41 (Bleeker specimen); *Thrissoctes dussumieri*: Fowler, 1941d:681 (Bombay, Calicut); *Thryssa dussumieri*:Chu, Tchang & Chen, 1963:112, fig.8 (East China Sea, but excluding adalae); *Thrysa dussumieri*-Whitehead, 1967a:142, fig.14c (jaw) (putative neotype); *Idem*, 1968a:23 (Arabian Sea, Bay of Bengal); *Idem*, 1969a:265, fig.47 (Singapore, Merbok estuary); Talwar & Whitehead, 1971:77 (types of *auratus*); Whitehead, 1973b:232, fig. 56 (synopsis); Wongratana, 1980:273, pls 239, 240 (revision); Whitehead & Bauchot, 1986:48 (no Valenciennes type in Paris).

FAO Names : En - Dussumier's thryssa.



Diagnostic Features : Body compressed, belly with 15 or usually 16 (rarely 14) plus 6 to 9 (usually 7 or 8) = 21 to 24 (usually 22 or 23) keeled scutes from isthmus to anus. Maxilla very long, reaching at least halfway along pectoral fin and to pelvic fin base in adults; first supra-maxilla absent; lower jaw slender. Gillrakers 17 to 19 (rarely 20), the serrae on the inner edge in distinct clumps. Anal finrays iii '29 to 37 (usually 31 to 35). A dark blotch behind upper part of gill opening, sometimes joined to a dark saddle on nape. Only *T. setirostris* has such a long maxilla, but lower jaw rises steeply within mouth, gillrakers only 10 to 12 and their serrae not clumped. See ENGR Thrys 7, Fishing Area 51.