Local Names: AUSTRALIA: Mud whiting.

Literature: Gloerfelt-Tarp and Kailola (1984:150).

Remarks: ***Sillago lutea*** may be confused with ***Sillago sihama*** and ***Sillago japonica.*** The swimbladder and cranial osteology is very similar to that of ***Sillago japonica*** but the majority of specimens have 13 abdominal vertebrae and a total count of 33, rather than 14 abdominal vertebrae and a total of 34, and attain sexual maturity at a smaller size. The number of scales between the first dorsal-fin origin and the lateral line afford a reliable external determination of the two species since ***S. lutea*** has 5 scales and ***S. japonica*** 3.

Sillago macrolepis Bleeker, 1859 | Fig. 115 | **SILL Sill 21**

Sillago macrolepis Bleeker, 1859:166 (Batavia; Bodeling, Bali).

Synonyms: ***Sillago (Parasillago) macrolepis:*** McKay, 1985:39-40, figs 4E, 13J, 18.

FAO Names: En - Large-scale sillago; **Fr** - Pêche-madame grandes écailles; **Sp** - Silago escamoso.

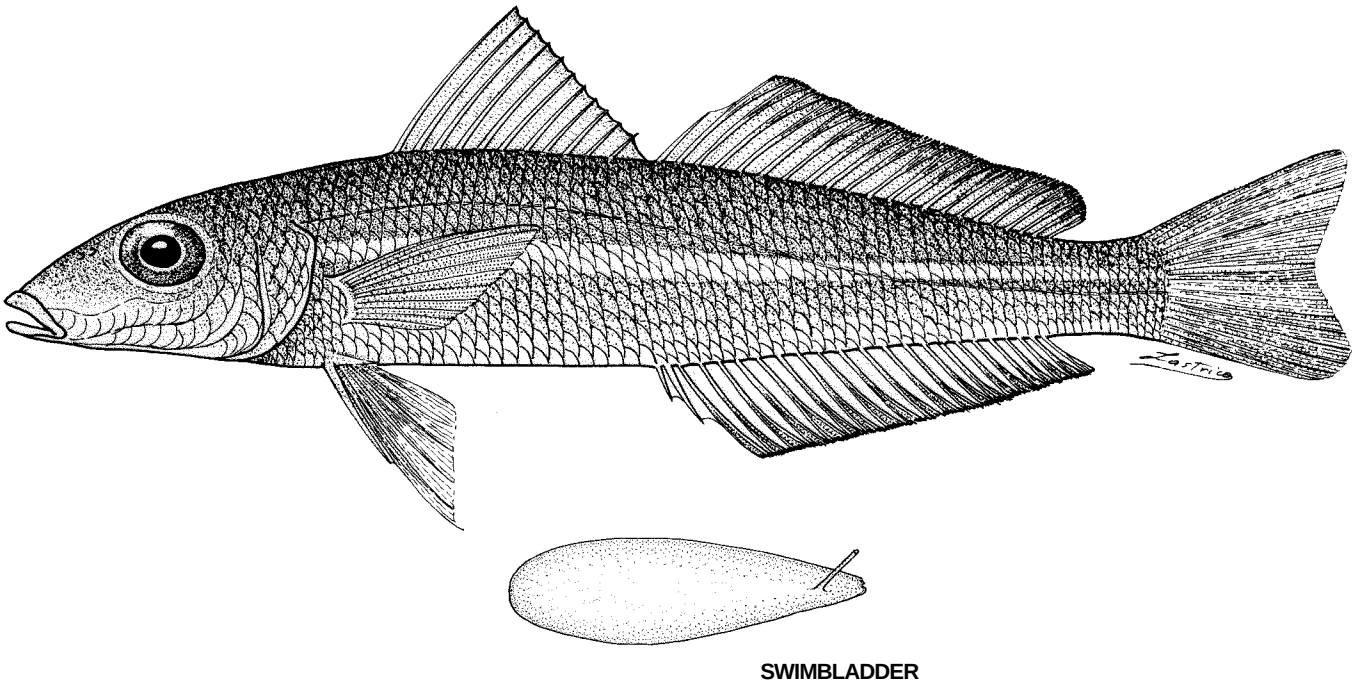

Fig. 115 ***Sillago macrolepis***
(after Bleeker, 1877)

Diagnostic Features: First dorsal fin with XI spines and second dorsal fin with I spine and 19 to 21 soft rays; anal fin with II spines and 19 to 21 soft rays. Lateral-line scales 51 to 56. Vertebrae: 14 abdominal + 20 caudal, total of 34 (no haemal bridge overlying the swimbladder). **Colour:** Yellowish, darker above, with a diffuse silvery midlateral stripe; dorsal fins dusky with a narrow blackish margin. Juveniles with a series of small brown spots, on each side along the back at the base of the dorsal fins, first dot at commencement of spinous dorsal fin, second about middle of spinous dorsal fin, third below fourth dorsal-fin ray, fourth below eleventh dorsal-fin ray, and last spot below end of second dorsal fin.

Geographical Distribution: Recorded from the Indonesian Archipelago, New Britain, Solomon Islands and the Philippine Islands (Fig. 116).

Habitat and Biology: Enters estuaries and may penetrate freshwater, at least as juveniles. Inhabits depths of 0 to 5 m.

Size: To 20 cm standard length.

Interest to Fisheries: Of minor importance at present.

Local Names:

Literature: Bleeker (1874:72, 1877, pl. 389, fig. 1); Günther (1860:246, description); Meyer (1885:28); Evermann and Seale (1907:87); De Beaufort (1913:120); Fowler (1928:235, 1933:16, 1934:422); Weber and de Beaufort (1931:171, description); Herre (1933:4, Sandakan, North Borneo, 1953:478); Munro (1958:178, New Guinea, 1967:346).

Remarks: The large eye, although not diagnostic, is a useful means of field identification as it is noticeably directed dorsally to provide for surface vision in shallow mangrove streams.

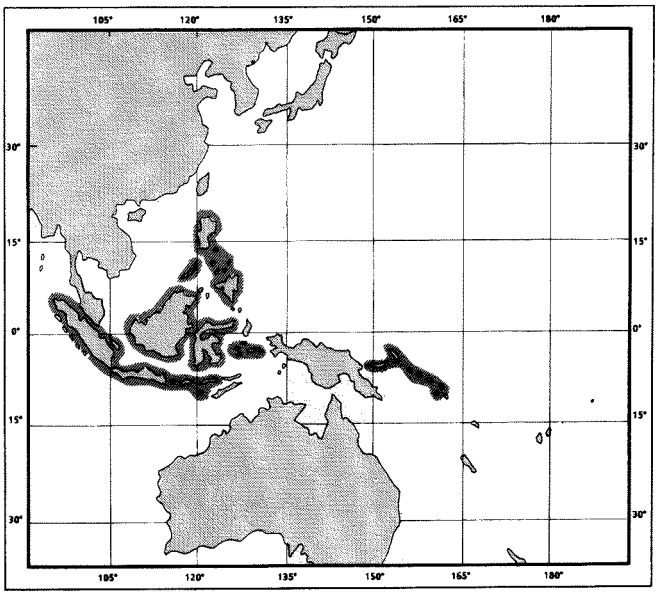

Fig. 116

Sillago maculata Quoy and Gaimard, 1824 Fig. 117 **SILL Sill 1**

Sillago maculata Quoy and Gaimard, 1824:261, pl. 5, fig. 2. (Sydney, New South Wales).

Synonyms: ***Sillago gracilis*** Alleyne and Macleay, 1877:279, pl. 6, fig. 2 (Torres Strait, Darnley Island or Hall Sound); Macleay, 1881:202; McCulloch, 1911:60 ***Sillago (Parasillago) maculata maculata:*** McKay, 1985:22-24, figs (revision).

FAO Names: En - Trumpeter sillago; **Fr** - Pêche madame trompette; **Sp** - Silago trompetero.

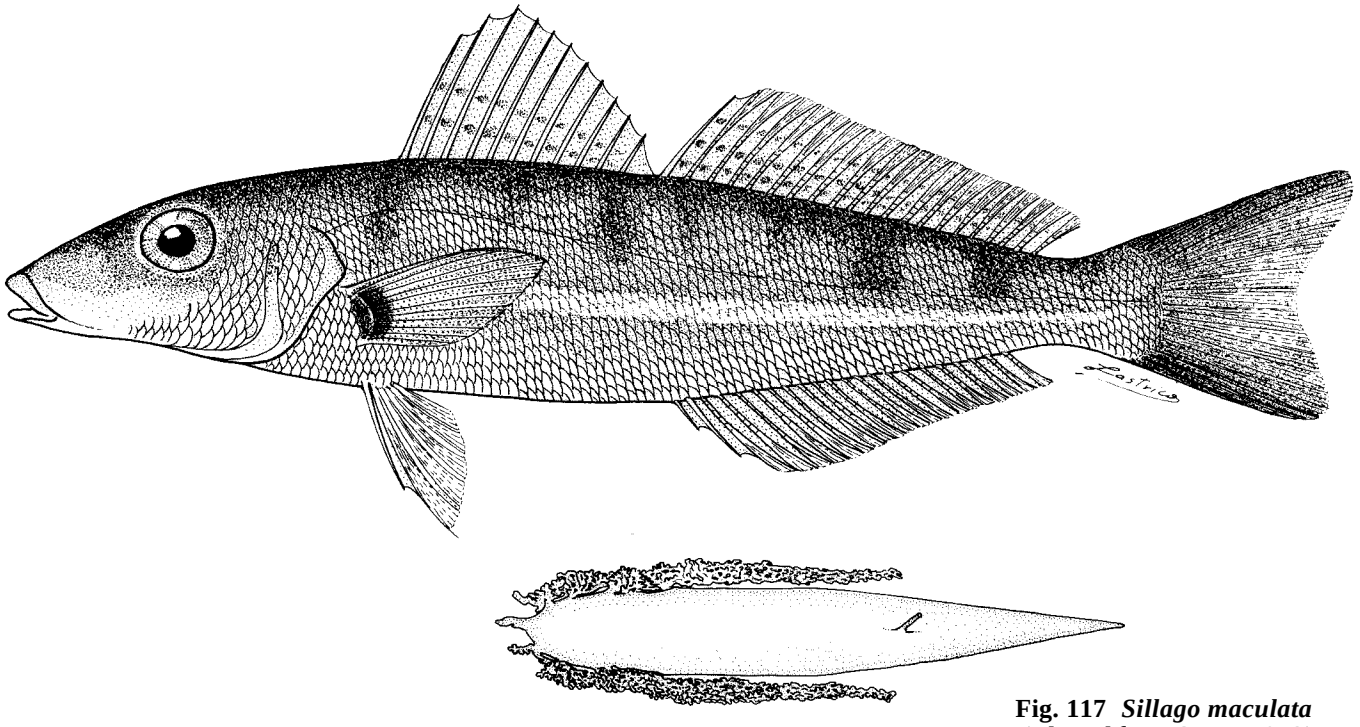

Fig. 117 ***Sillago maculata*** **(adapted from Grant, 1972)**

Diagnostic Features: First dorsal fin with XI (rarely XII) spines and second dorsal fin with I spine and 19 to 21 soft rays; anal fin with II spines and 19 or 20 soft rays. Lateral-line scales 71 to 75. Vertebrae: 13 to 15 abdominal + 8 to 11 modified + 10 to 14 caudal, total of 34 to 36. Anterolateral extensions of swimbladder recurved posteriorly to reach level of vent. **Colour:** A black spot at base of pectoral fin, dark blotches on back and side of body, the upper and lower blotches are frequently joined, at least posteriorly, the upper blotches are generally larger; the opercle is dull or with an inner dark blotch showing through. Coloration similar to ***S. burrus*** and ***S. aeolus.***

Geographical Distribution: East Coast of Australia (Fig. 118).

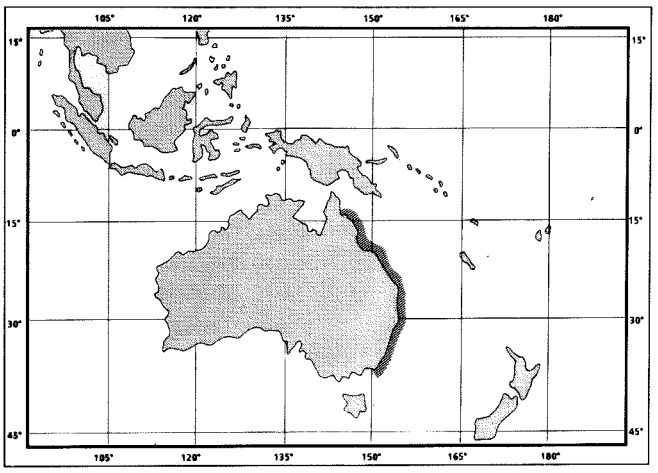

Fig. 118

Habitat and Biology: Found on silty and muddy substrates in the deeper water of bays, but also frequenting the mouths of rivers, estuaries and mangrove creeks. It is known from a depth range of 0 to 50 m. The juveniles are most abundant in estuaries and shallow water during the summer months, moving into deeper water as they mature. Burchmore et al. (1988) found that within Botany Bay, New South Wales, this species has an extended reproductive period from October to April, with fish running ripe most abundant in December and February. As relatively large numbers of fish running ripe were taken over deep sand or mud sites, they hypothesized that this species spawns within the Bay. Diet of juveniles is largely small crustaceans and that of the adult fish mostly polychaete worms.

Size: To 30 cm total length.

Interest to Fisheries: A very popular angling fish taken in large numbers by dinghy fishermen during the winter months in southern Queensland. Large quantities are taken by trawlers working in Moreton Bay, mainly as a bycatch of the prawn fishery. The fish are marketed fresh. Trawled fish are frequently bruised and the flesh may spoil rapidly. For this reason it is not as popular in the market as netted species.

Local Names: AUSTRALIA: Trumpeter whiting, Winter whiting, Diver whiting.

Literature: Cuvier (1829:411); Sleeker (1849:5, 8, 10, 14, 62, part, 1874:71, part); Günther (1860:245); Steindachner (1866:444-445, 1870:562); Castelnau (1875:16, 1979:380); Alleyne and Macleay 1877:279); Klunzinger (1879:370); Schmeltz (1879:44); Macleay (1881:201); Tenison-Woods (1882:65, pl. 23); Pohl (1884:32); Ogilby (1886:31, 1893:101); Johnston (1891:33);. Cohen (1892:16); Waite (1898:30, 1899:109, 1902:190, 1904:31); Stead (1906a:574-576, 1908b:64); McCulloch (1911:61, 1921:61, 1927:51, pl. 21, fig. 1846); Weber (1913:267); Fowler (1925:248,1933:423-425, part); Barnard (1927:508); Weber and de Beaufort (1931:174, part); Borodin (1932:85); Herre (1939:327, 1953:478-479, part); Smith (1949:204); Roughley (1951:48, pl. 16); Palakar and Bal (1955:128, part); Scott (1959:56); Marshall (1964:169, pl. 34); Whitley (1964:43); Grant (1965:86, fig., 1972:246, fig.); Maclean (1971:87-92); Weng (1983, 1986); Hutchins and Swainston (1986:col. pl. 267b).

Remarks: The species is geographically sympatric with the western trumpeter whiting (see ***Sillago burrus)*** and, therefore, both are treated as full species in this work as is ***Sillago aeolus.***

Sillago megacephalus Lin, 1933 (No figure available) **SILL Sill 22**

Sillago megacephalus Lin, 1933:96, fig. 3 (Paoping Harbour, Hainan, China).

Synonyms: None.

FAO Names: En - Large-headed sillago; **Fr** - Pêche-madame grande tête; **Sp** - Silago cabezudo.

Diagnostic Features: Very similar to ***Sillago sihama,*** but with the head length 33% of standard length. First dorsal fin with XI spines and second dorsal fin with I spine and 22 soft rays; anal fin with II spines and 23 soft rays. Lateral-line scales about 70.

Geographical Distribution: China (Fig. 119).

Habitat and Biology: Unknown.

Size: Described from a small specimen (158 mm standard length).

Interest to Fisheries: Unknown.

Local Names:

Literature: Fowler, 1949:51.

Remarks: ***Sillago megacephalus*** is known only from the description of the holotype, the holotype itself is apparently lost (McKay, 1985). It is unusual in having the head length 33% of the body length according to the description of Lin (1933). ***Sillago sihama*** rarely has the head length to 30%, and in most specimens the head length is about 27% to 28% of standard length. The dimensions from the figure of ***S. megacephalus*** in Lin (1933) give a head length of about 27% standard length. This species is possibly a junior synonym of ***Sillago sihama.***

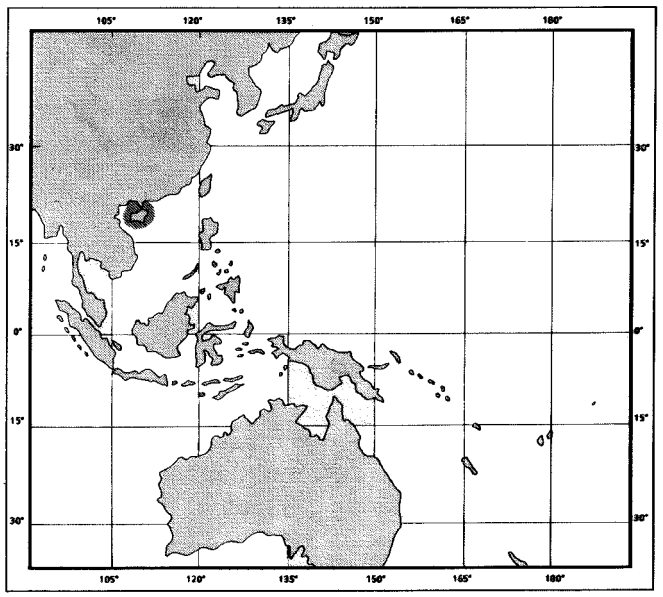

Fig. 119

Sillago microps McKay, 1985

Fig. 120

SILL Sill 23

Sillago (Parasillago) microps McKay, 1985:44-45 (Taipei Market, Taiwan).

Synonyms: None.

FAO Names: En - Small-eyed sillago; **Fr** - Pêche-madame petits yeux; **Sp** - Silago de ojos pequeños.

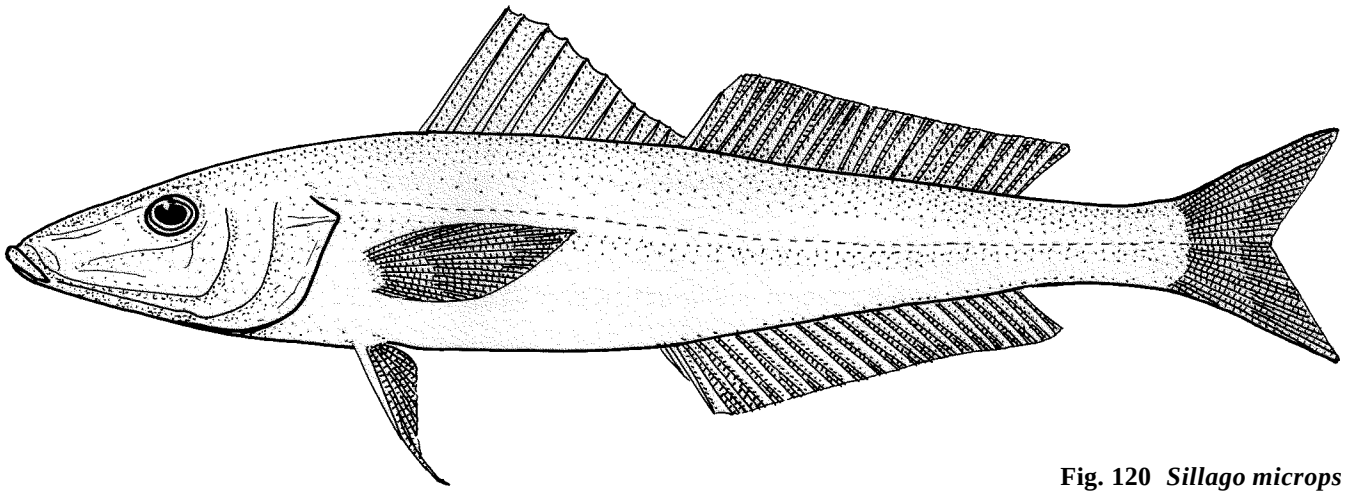

Fig. 120 ***Sillago microps***

Diagnostic Features: A small eye (14% to 16% of head length). First dorsal fin with XI spines and second dorsal fin with I spine and 19 soft rays; anal fin with II spines and 19 soft rays. Lateral-line scales 68 to 69; cheek scales cycloid. Vertebrae: 13 abdominal + 5 modified + 16 caudal.

Geographical Distribution: Taiwan (Fig. 121).

Habitat and Biology: Unknown.

Size: To at least 20 cm standard length.

Interest to Fisheries: None.

Local Names:

Literature: Shao et al., 1986:148-149.

Remarks: This new species is known only from the holotype and one paratype from Taiwan, collected with two specimens of ***Sillago parvisquamis,*** and one specimen of ***Sillago sihama.*** Not collected by Shao et al. (1986) in their review of the family from Taiwan. The swimbladder structure is unknown at present.

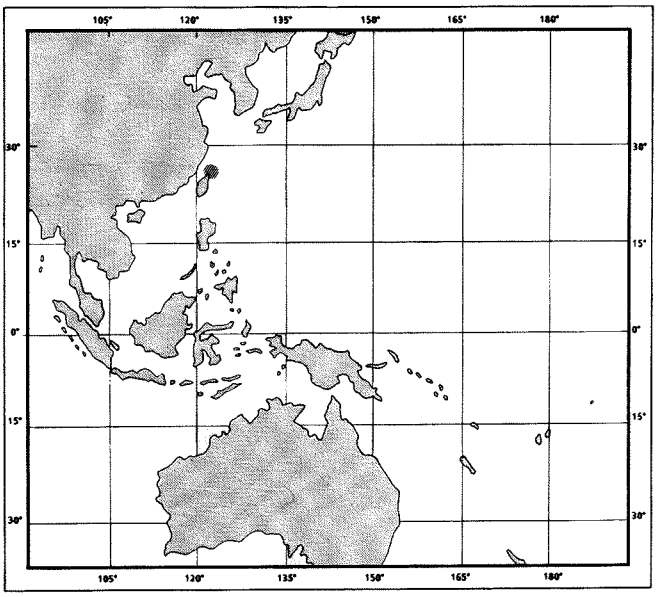

Fig. 121

Sillago nierstraszi Hardenberg, 1941 Fig. 122 **SILL Sill 24**

Sillago nierstraszi Hardenberg, 1941:228 (Merauke, New Guinea).

Synonyms: ***Sillago (Parasillago) nierstraszi*****:** McKay, 1985:19-20.

FAO Names: En - Rough sillago; **Fr** - Pêche-madame rêche; **Sp** - Silago rugoso.

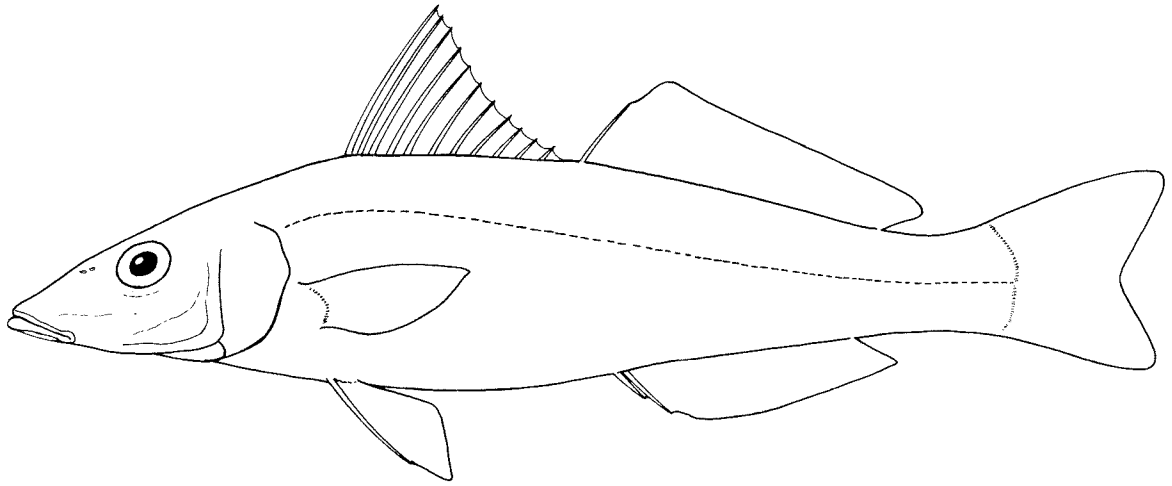

Fig. 122 ***Sillago nierstraszi***

Diagnostic Features: First dorsal fin with XI spines and second dorsal fin with I spine and 17 soft rays; anal fin with II spines and 17 soft rays. Between base of first dorsal-fin spine and lateral line 4 scales.

Geographical Distribution: Southern New Guinea (Fig. 123).

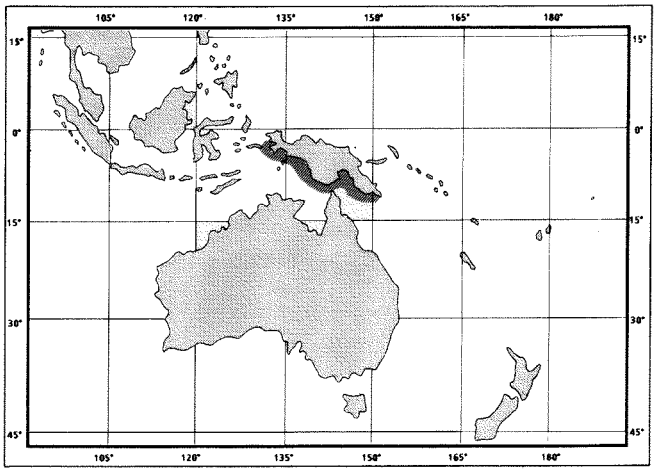

Fig. 123

Habitat and Biology: Inshore benthic habitat.

Size: The holotype was reported as 25 cm total length (Hardenberg, 1941).

Interest to Fisheries: None.

Local Names:

Literature: Munro, 1958:178.

Remarks: Possibly a senior synonym of ***Sillago analis***. ***Sillago nierstraszi*** is known only from the holotype which could not be located. Hardenberg (1941:288) states that this species is related to ***Sillago macrolepis*** according to the lateral-line scales (***S. macrolepis*** has 52 to 56 lateral-line scales), but differs in the transverse scale count, the smaller eye, the low anal-fin ray count, and in having ctenoid scales on the head. In most features ***Sillago nierstraszi*** is similar to ***Sillago analis*** and may prove to be a senior synonym.

Sillago parvisquamis Gill, 1861 Fig. 124 **SILL Sill 25**

Sillago parvisquamis Gill, 1861:505 (Kanagawa, near Yokohama).

Synonyms: ***Sillago sihama*** (non ***Sillago sihama*** Forsskål): Tanaka, 1913:241, pl. 68, fig. 244; Masuda et al., 1984:151, pl. 134-C. ***Sillago (Sillago) parvisquamis:*** McKay, 1985:12-13, figs 2D, 7A, 13B, 14B, 15.

FAO Names: En - Small-scale sillago; **Fr** - Pêche-madame petites écailles; **Sp** - Silago liso.

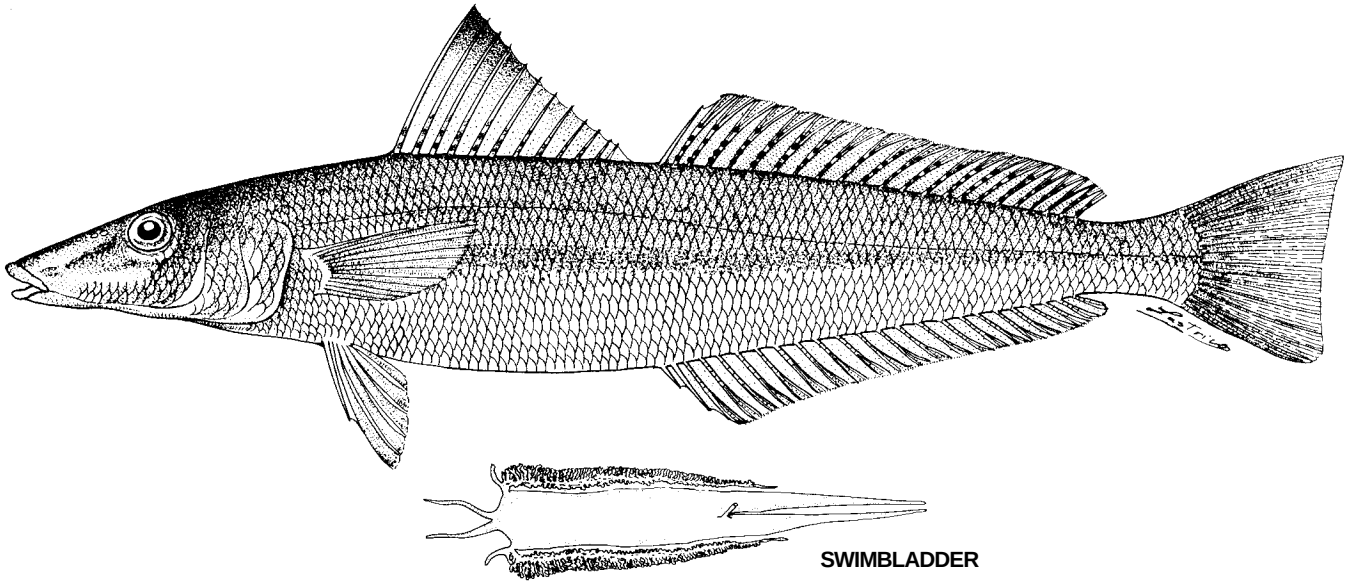

Fig. 124 ***Sillago parvisquamis***

Diagnostic Features: First dorsal fin with XII or XIII spines and second dorsal fin with I spine and 20 to 22 soft rays; anal fin with II spines and 22 or 24 soft rays. Lateral-line scales 79 to 84. Vertebrae: 16 abdominal + 5 or 6 modified + 17 to 19 caudal, total of 39 to 40. Swimbladder with two posterior extensions. **Colour:** Pale brown to dull brown above, lighter below; a faint mid-lateral stripe usually present; dorsal fins dusky terminally with five or six rows of dusky spots on second dorsal fin membranes, other fins hyaline.

Geographical Distribution: Tokyo and Yokohama, Tokyo Bay, Japan, Taiwan (Fig. 125).

Habitat and Biology: Inhabits tidal flats in the estuary zone near large rivers. Occurs in depths between 0 and 30 m.

Size: To 30 cm standard length.

Interest to Fisheries: The fishery is possibly in decline due to habitat alteration by reclamation and pollution (Sano and Mochizuki, 1984).

Local Names: JAPAN: Ya-gisu, Ao-gisu.

Literature: Jordan et al. (1913:187); Jordan and Hubbs (1925:248); Fowler (1933:427-428); Tomiyama and Abe (1958:1176-1177); Shao and Chang (1978:5-6, pl. 1, fig. 2, and pl. 2. fig. 2, 1979:695-705); Sano and Mochizuki (1984:141-143, fig. 1 B); Shao et al. (1986:147, fig. 6C).

Remarks: Possibly a candidate for aquaculture. The flesh is firm and well accepted in Japan.

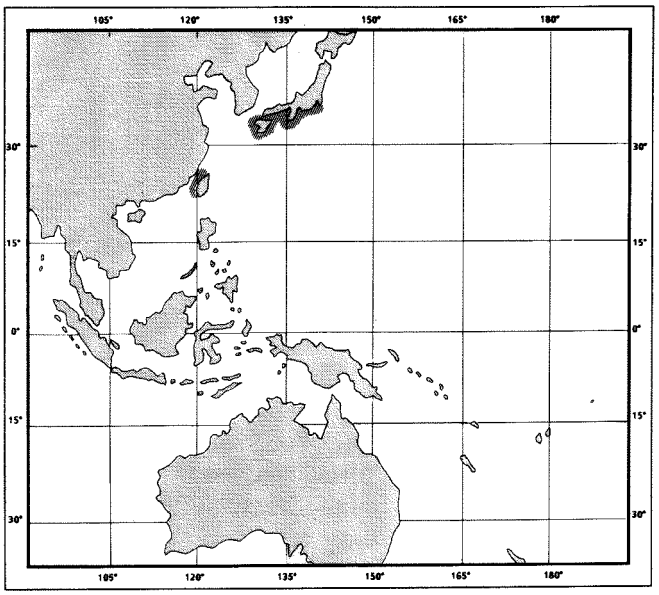

Fig. 125

Sillago robusta Stead, 1908 Fig. 126 **SILL Sill 26**

Sillago robusta Stead, 1908a:7 (Rose Bay, Port Jackson, New South Wales).

Synonyms: ***Sillago auricomis*** Ogilby, 1910:97-98 (Between Moreton Island and Hervey Bay); Whitley, 1932a:344; Ladiges et al., 1958:164-165. ***Sillago (Parasillago) robusta:*** McKay, 1985:30-33, figs 4C, 11D-J, 13R-T, 14M-N, 18.

FAO Names: En - Stout sillago; **Fr** - Pêche-madame gaillard; **Sp** - Silago obeso.

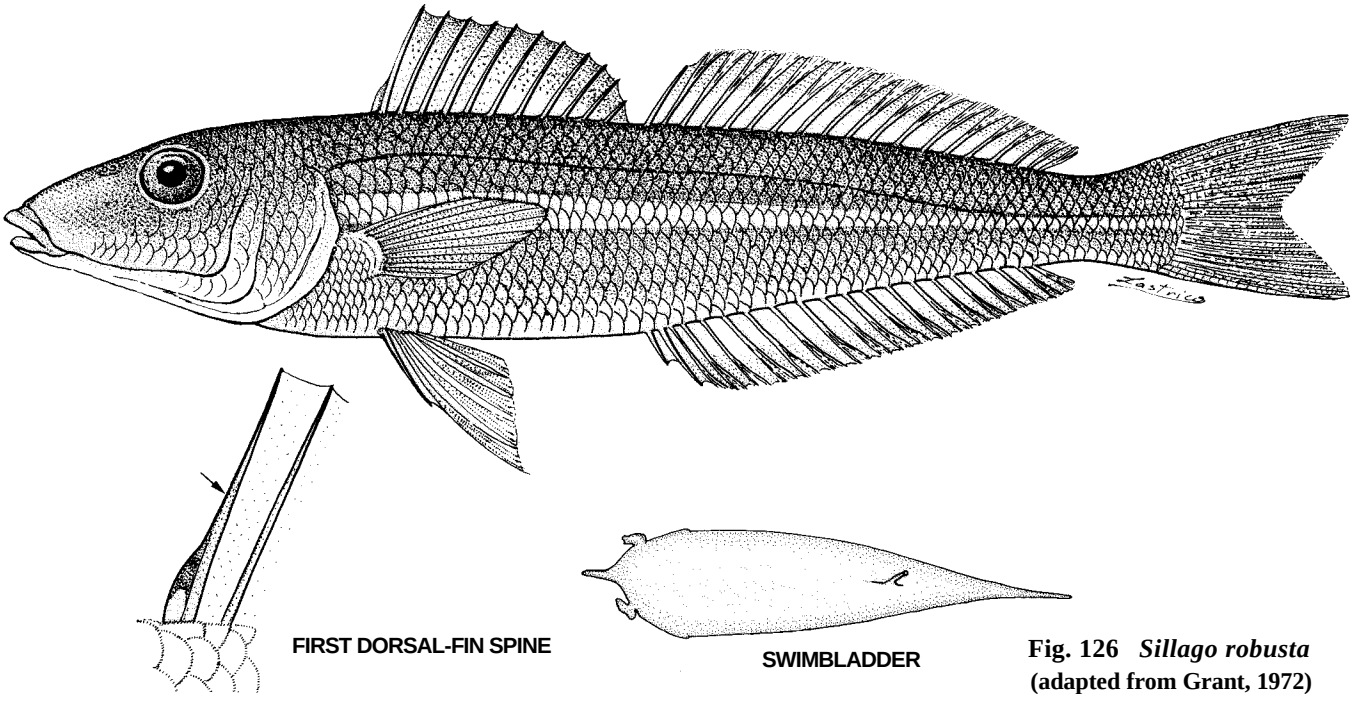

Fig. 126 ***Sillago robusta*** **(adapted from Grant, 1972)**

Diagnostic Features: First dorsal fin with XI spines and second dorsal fin with I spine and 16 to 18 soft rays, first dorsal-fin spine of large specimens with a sharply keeled anterior edge; anal fin with II spines and 16 or 19 soft rays. Lateral-line scales 64 to 70. Vertebrae: 13 abdominal + 20 caudal, total of 33. **Colour:** The base of the first dorsal-fin spine yellow and remainder of its keel dark brown to blackish; body with a midlateral silvery stripe, and a yellow blotch on cheek.

Geographical Distribution: Endemic to Australian waters from Fremantle northward to Shark Bay (western population), and from southern Queensland to New South Wales (eastern population) (Fig. 127).

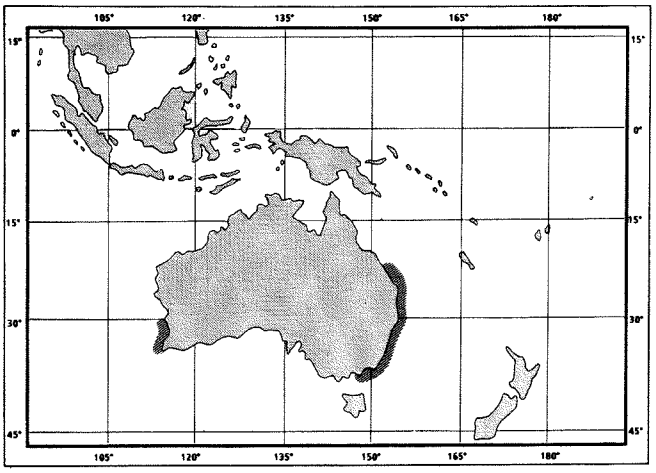

Fig. 127

Habitat and Biology: Offshore species inhabiting sandy substrates, between 10 and 70 m. Inside Shark Bay, Western Australia, and Moreton Bay, Queensland, the species is common, but not abundant, and is usually associated with ***Sillago maculata.*** Most of the stout sillago taken by trawlers inside Moreton Bay are juveniles less than 10 cm (Weng, 1986). Juveniles feed largely on crustaceans such as copepods (39%) and mysidaceans (15%) whereas larger fishes (11 to 20 cm) consume more polychaetes (Burchmore et al., 1988). In more northern areas in sandy-mud or turbid silty areas, it is replaced by ***Sillago lutea.*** Attains sexual maturity below a standard length of 13 cm and rarely exceeds 17 cm in Western Australia, although the species has been recorded to 28 cm in length by trawling vessels working in depths of 63 m off southern Queensland (Grant 1965).

Size: To 30 cm total length.

Interest to Fisheries: Occasionally marketed fresh as a bycatch of prawn trawlers working off Moreton Bay. The bulk of the catch is below 25 cm and until recently did not fetch a good price. A small fishery is developing on the trawl grounds outside Moreton Bay and is now subject to research. Sometimes marketed in Asian food stores in Brisbane. The flesh is soft and trawled fish are frequently bruised. The stout sillago may comprise up to 10% of the "school" whiting ***(S. flindersi)*** catch in New South Wales.

Local Names: AUSTRALIA: Stout whiting.

Literature: McCulloch (1921:61); Marshall (1964:170); Whitley (1964:43); Grant (1965:87, 1972:247, fig.); Allen and Swainston (1988:col. pl. 355, W.A. form); Burchmore et al. (1988, biology).

Remarks: This little known species is now targeted as a valuable component of the prawn trawl bycatch.

Sillago schomburgkii Peters, 1865	Fig. 128	**SILL Sill 27**

Sillago schomburgkii Peters, 1865:319 (Adelaide, South Australia).

Synonyms: ***Sillago bostockii*** Castelnau, 1873:133 (Swan River and at sea, Western Australian); McCulloch, 1911:60,63, 1912:87-88; Whitley, 1948:19,1951:65. ***Sillago bassensis*** (non ***Sillago bassensis*** Cuvier): Waite, 1902:190-191,1921:101, 1923:123-124,1928. ***Sillago frazeri*** Whitley, 1944:270 (Leschenault Inlet, Bunbury, Western Australia), 1948:19,1951:65; Roughley, 1951:49. ***Sillago (Parasillago) schomburgkii*:** McKay, 1985:34-36, figs 4D, 11C, 13W, 140,18.

FAO Names: En - Yellowfin sillago; **Fr** - Pêche-madame ubi; **Sp** - Silago aleta amarilla.

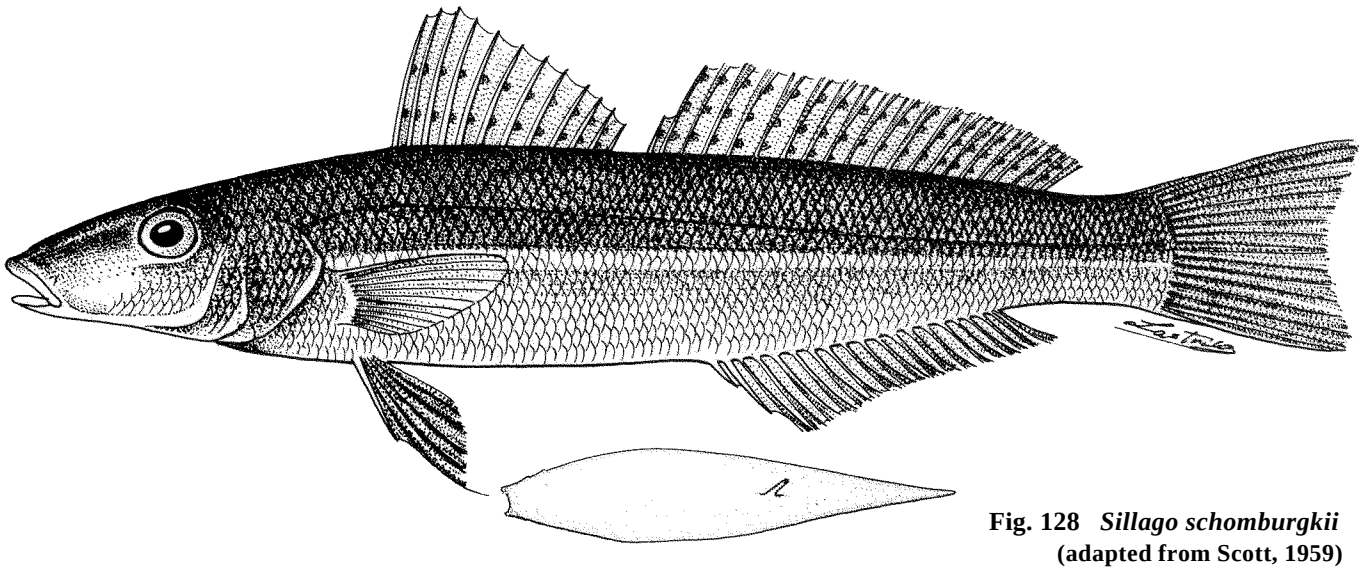

Fig. 128 ***Sillago schomburgkii***
(adapted from Scott, 1959)