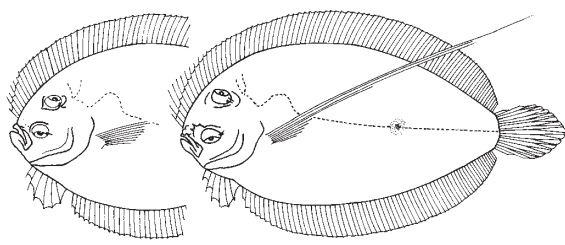


**BOTHIDAE**

**Lefteye flounders**

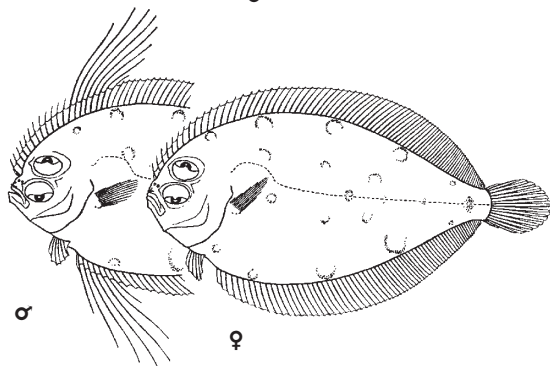
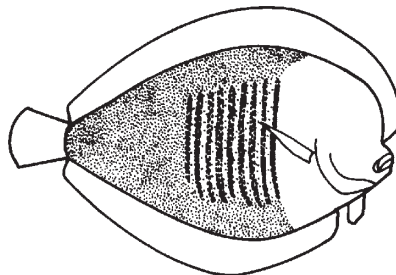
by D.A. Hensley and K. Amaoka

**Diagnostic characters:** Body shape variable, deep to elongate, compressed (size to 88 cm). **Margin of preopercle distinct, not covered by skin and scales;** males of some species show various combinations of sexually dimorphic characters on head such as wider interorbital areas and rostral and/or orbital spines. **Eyes on left side of head, reversals rare;** some species with tentacles on the eyes. **Dorsal-fin origin above or ahead of anterior margin of upper eye; no fin spines;** urinary papilla on eyed side; **caudal fin not attached to dorsal and anal fins;** caudal fin usually with 17 rays; in some species certain fin rays are elongate in the males; pectoral fin of blind side present but shorter than pectoral fin on eyed side (in Indo-West Pacific species); pelvic fins present, with 6 or 7 soft rays; **pelvic fin of eyed side on midventral line with origin anterior to origin of pelvic fin of blind side; pelvic fin of blind side above midventral line.** **Lateral line of eyed side with high arch over pectoral fin;** lateral line absent below lower eye. Five series of intermuscular bones present. **Colour:** eyed side usually with spots, blotches, or rings; blind side light coloured except in some species in which males have a dark colour pattern on the blind side.



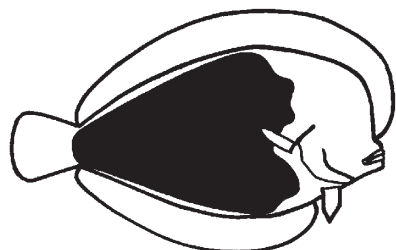
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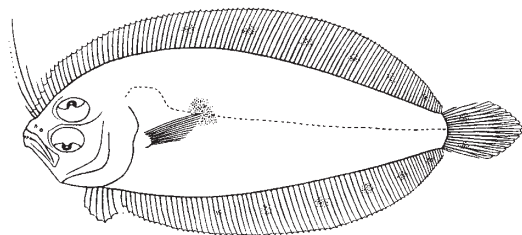
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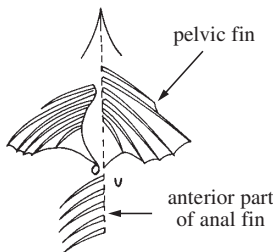


examples of deep-bodied lefteye flounder species showing various combinations of sexually dimorphic characters

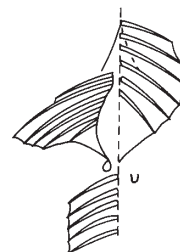
examples of lefteye flounder species showing dark colour patterns on the blind sides of the males



example of elongate-bodied lefteye flounder



pelvic fin on eyed side only slightly anterior to that on blind side



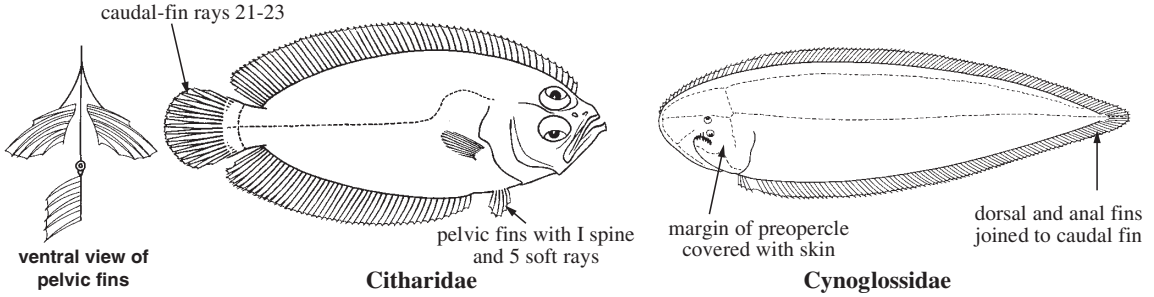
pelvic fin on eyed side far anterior to that on blind side

ventral views of pelvic fins

**Similar families occurring in the area**

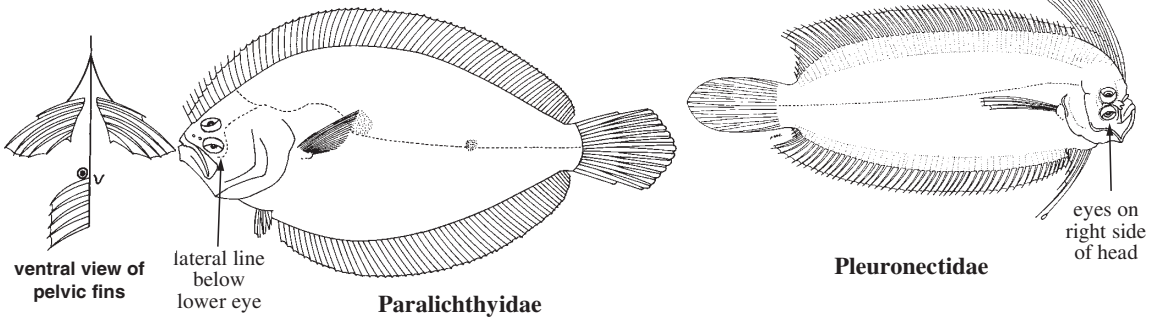
**Citharidae:** pelvic fins with I spine and 5 soft rays and nearly symmetrically placed on both sides of midventral line; caudal fin with 21 to 23 rays; eyes normally on left side of head in some species and right side of head in other species, reversals rare.

**Cynoglossidae:** dorsal and anal fins attached to caudal fin; pectoral fins absent in adults; most species with only 1 pelvic fin with 4 rays; margin of preopercle not distinct, covered with skin and scales; rostral hook usually present below mouth; no high arch in lateral line; caudal fin with 8 to 14 rays, none branched.



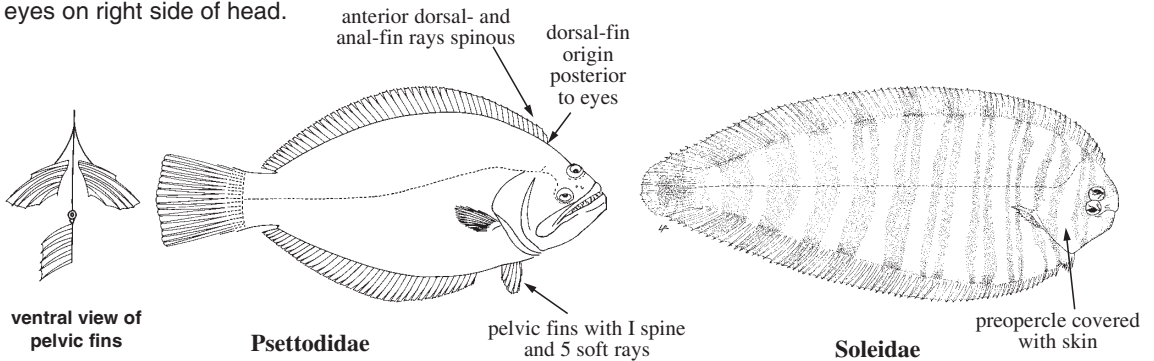
**Paralichthyidae:** eyes also on left side of head, but pelvic fins short-based and symmetrically placed on either side of midventral line; lateral line present below lower eye.

**Pleuronectidae:** eyes on right side of head, reversals rare in tropical species. Anterior dorsal-fin rays and rays of pelvic fin on eyed side greatly elongate in *Samaris*, the only genus with a commercial species in the area, but not in the majority of species.



**Psettodidae:** dorsal-fin origin well posterior to upper eye; spines in dorsal, anal, and pelvic fins; pectoral fins on eyed and blind sides about equal in length; pelvic fins symmetrically placed on each side of midventral line; body thick; urinary papilla and anus on midventral line anterior to origin of anal fin; no high arch in lateral line over pectoral fin; branch of lateral line below lower eye; eyes on right or left side of head; upper eye on dorsal surface of head.

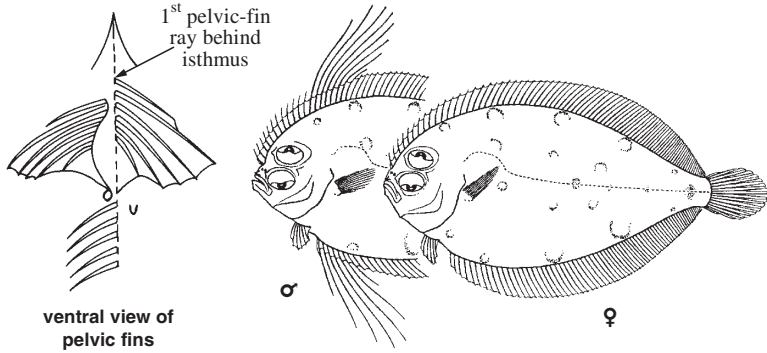
**Soleidae:** margin of preopercle not distinct, covered with skin and scales; each pelvic fin with 5 soft rays; eyes on right side of head.



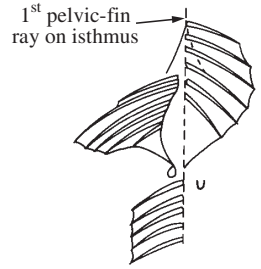
**Key to the genera of Bothidae**

Note: species names are given when a genus contains a single species, or if only a single species of the genus is known from the area.

- 1a. First ray of pelvic fin on eyed side behind isthmus; first ray of pelvic fin on blind side opposite second ray of pelvic fin on eyed side (Fig. 1) . . . . . *Taeniopsetta ocellata*  
(presence in the area uncertain; unconfirmed report from New Caledonia)
- 1b. First ray of pelvic fin on eyed side on or near isthmus; first ray of pelvic fin on blind side opposite third or fourth ray of pelvic fin on eyed side (Fig. 2) . . . . . → 2



**Fig. 1** *Taeniopsetta ocellata*



**Fig. 2**

- 2a. Upper jaw 0.9 to 1.8 times in head length, extending to or well beyond rear edge of lower eye (Fig. 3) . . . . . → 3
- 2b. Upper jaw 2 times in head length (or greater), not extending to rear edge of lower eye (Fig. 4) . . . . . → 4

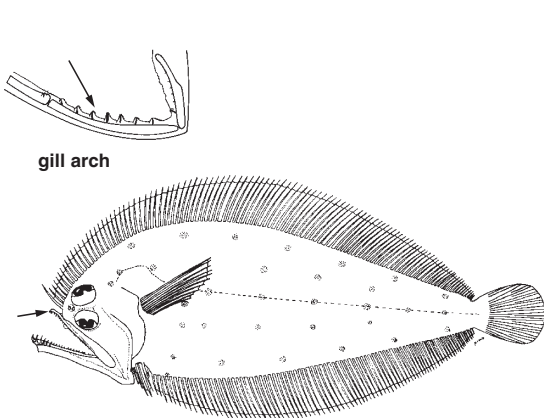


**Fig. 3**

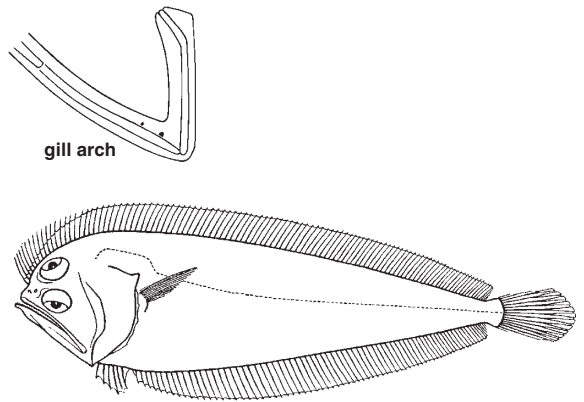


**Fig. 4**

- 3a. Front tip of upper jaw strongly protruding beyond tip of snout; large canine teeth on anterior area of lower jaw; gill rakers short but easily seen (Fig. 5) . . . . . *Kamoharaia megastoma*
- 3b. Front tip of upper jaw not protruding beyond tip of snout; no enlarged canine teeth in either jaw; gill rakers absent or rudimentary (Fig. 6) . . . . . *Chascanopsetta lugubris lugubris*

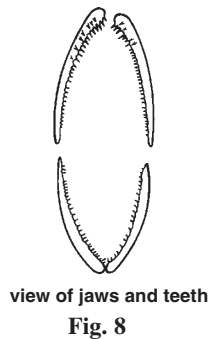
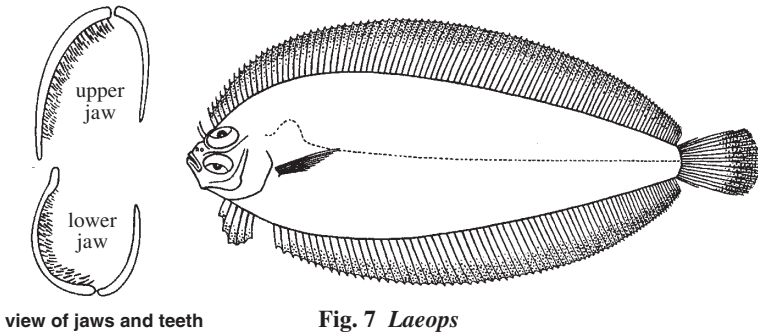


**Fig. 5** *Kamoharaia megastoma*



**Fig. 6** *Chascanopsetta lugubris*

- 4a. All upper-jaw teeth and all (or nearly all) lower-jaw teeth confined to blind side (Fig. 7) . . . . . *Laeops*
- 4b. Teeth present on both sides of jaws (Fig. 8) . . . . . → 5



- 5a. Lateral line present on blind side; 3 obvious blotches or eye spots forming triangle on eyed side (Fig. 9) . . . . . *Grammatobothus*
- 5b. Lateral line absent or weakly developed on blind side . . . . . → 6

- 6a. Nearly continuous bony ridge extending from anterior margin of lower eye to posterior margin of upper eye, in some species this ridge forms the entire interorbital area, in others it forms the ventral margin of a small concave area in front of the interorbital region; interorbital region narrow, its width less than eye diameter in both sexes and at all sizes (Fig. 10a) . . . . . → 7
- 6b. No distinct bony ridge extending from anterior margin of lower eye to posterior margin of upper eye; interorbital region distinctly concave, in most species increasing in relative width with size and wider in males than females (Fig. 10b, c) . . . . . → 11

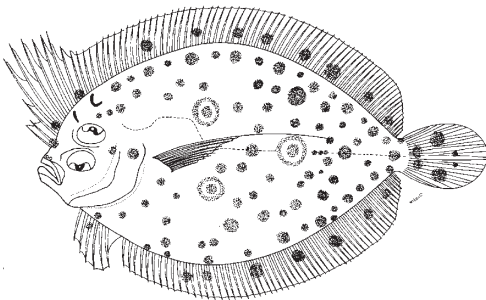


Fig. 9 *Grammatobothus*

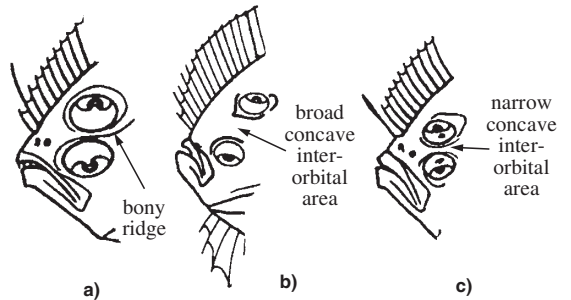


Fig. 10

- 7a. Males with bony tubercles on snout and tip of lower jaw; head tubercles weakly developed or absent in females; anterior dorsal-fin rays greatly elongate in males (Fig. 11) . . . . . *Lophonectes gallus*
- 7b. Males without rostral spines or tubercles (Fig. 12) . . . . . → 8

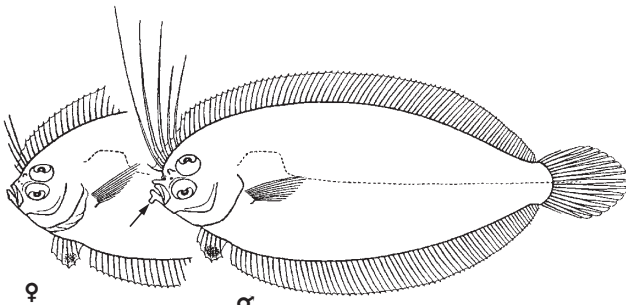


Fig. 11 *Lophonectes gallus*

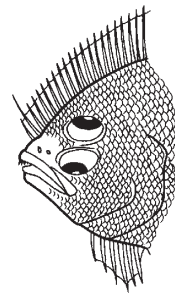


Fig. 12

- 8a. Head length 3.2 to 4.5 times in standard length . . . . . → 9
- 8b. Head length 4.6 to 5.7 times in standard length . . . . . → 10

- 9a. Scales on eyed side with short ctenii or scales cycloid (Fig. 13) . . . . . *Arnoglossus*
- 9b. Scales on eyed side with elongate ctenii (Fig. 14) . . . . . *Psettina*

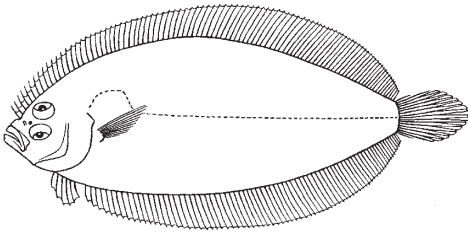
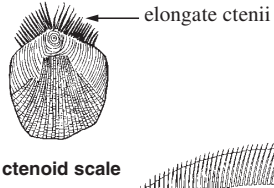
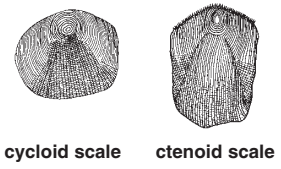


Fig. 13 *Arnoglossus*

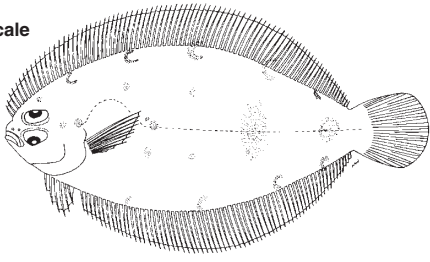


Fig. 14 *Psettina*

- 10a. Head profile rising steeply from snout to area above pectoral fin; upper-jaw length 2.4 to 2.8 times in head length; eye diameter 4.1 to 5.3 times in head length (Fig. 15) . . . . . *Neolaeops microphthalmus*
- 10b. Head profile rising gradually from snout to area above pectoral fin; upper-jaw length 3.1 to 3.8 times in head length; eye diameter 2.7 to 3.6 times in head length (Fig. 16) . . . . . *Japonolaeops dentatus*

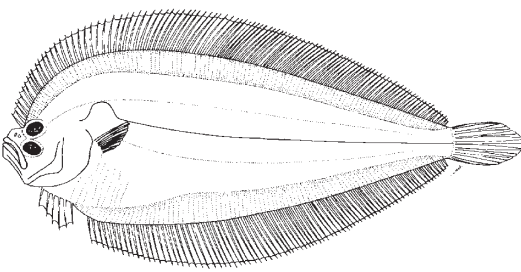


Fig. 15 *Neolaeops microphthalmus*

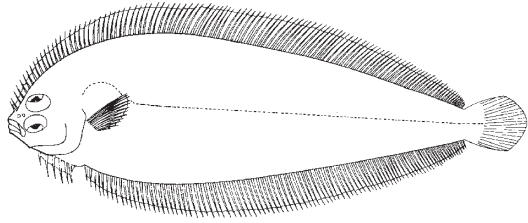


Fig. 16 *Japonolaeops dentatus*

- 11a. First dorsal-fin ray elongate, longer than second ray; gill rakers palmate in shape (Fig. 17) . . . . . *Asterorhombus*
- 11b. First dorsal-fin ray not elongate, shorter than second ray; gill rakers not palmate (Fig. 18) . . . . . → 12

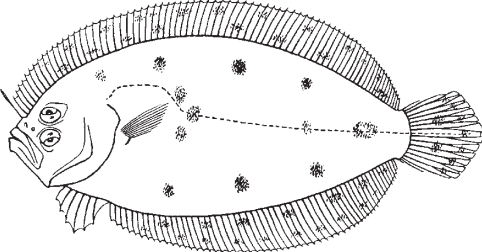
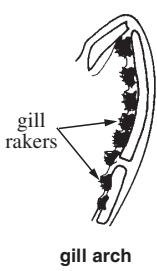


Fig. 17 *Asterorhombus*

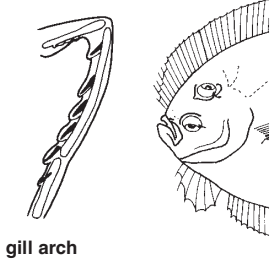


Fig. 18

- 12a. First ray of pelvic fin of eyed side below posterior margin of lower eye (Fig. 19a) . . . . . → 13
- 12b. First ray of pelvic fin of eyed side below middle or front half of lower eye (Fig. 19b) . . . . . → 14
- 13a. Series of light-coloured spots along head margin anterior to interorbital region (Fig. 20) . . . . . *Tosarhombus*
- 13b. No light-coloured spots along head margin anterior to interorbital region (Fig. 21) . . . . . *Parabothus*

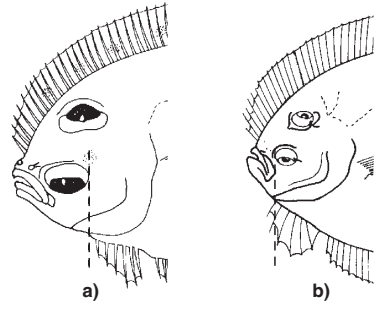


Fig. 19

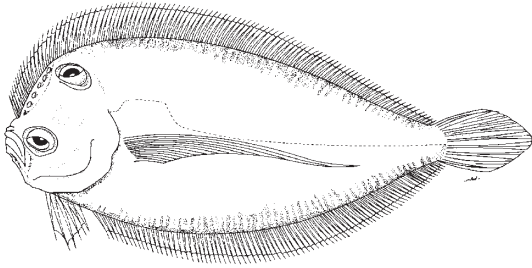


Fig. 20 *Tosarhombus*

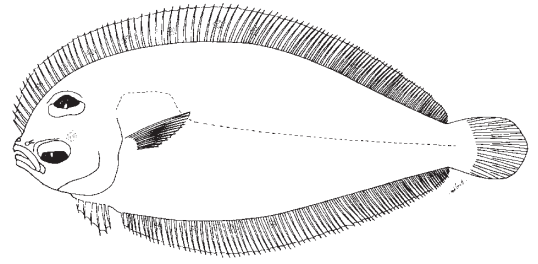


Fig. 21 *Parabothus*

- 14a. Lateral-line scales 69 or more (Fig. 22) . . . . . *Bothus*
- 14b. Lateral-line scales 36 to 63 . . . . . → 15
- 15a. Scales on eyed side with elongate ctenii (Fig. 23) . . . . . *Crossorhombus*
- 15b. Scales on eyed side with short ctenii (Fig. 24) . . . . . *Engyprosopon*

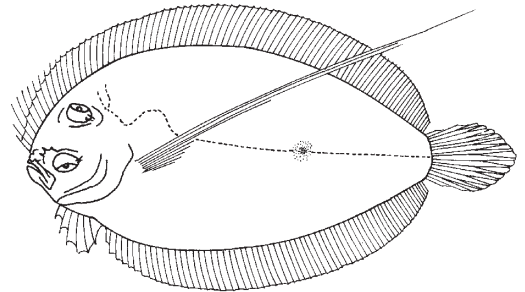


Fig. 22 *Bothus*

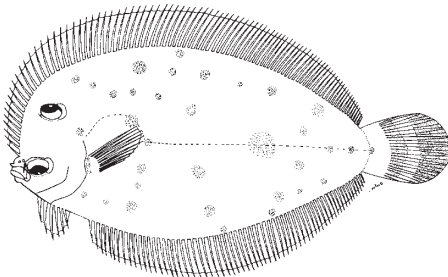


Fig. 23 *Crossorhombus*

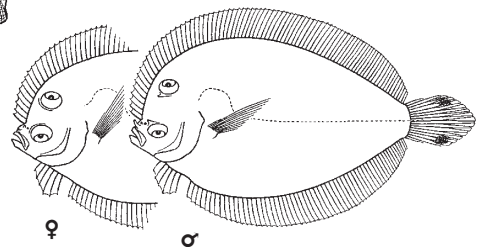
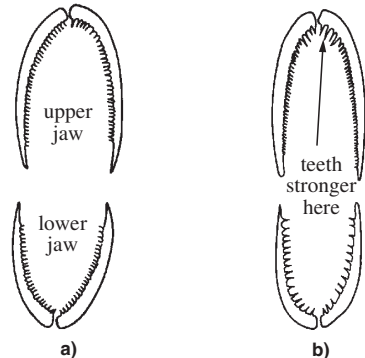


Fig. 24 *Engyprosopon*

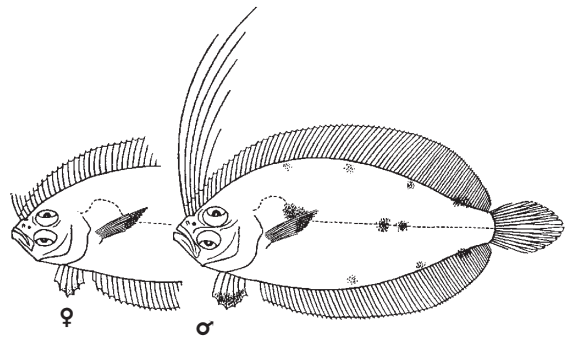
**Key to the species of *Arnoglossus* occurring in the area**

- 1a. Teeth in both jaws small, closely spaced (Fig. 25a) . . . . . → 2
- 1b. Anterior teeth of upper jaw larger than posterior teeth; teeth of lower jaw stronger and more widely spaced than lateral teeth of upper jaw (Fig. 25b) . . . . . → 8
- 2a. Body depth 2.4 to 3.1 times in standard length; anterior rays of dorsal fin greatly elongate in males, not or only slightly elongate in females (Figs 26 or 27) . . . . . → 3
- 2b. Body depth 1.9 to 2.9 times in standard length; anterior rays of dorsal fin not or only slightly elongate (Figs 28 to 38) . . . . . → 4

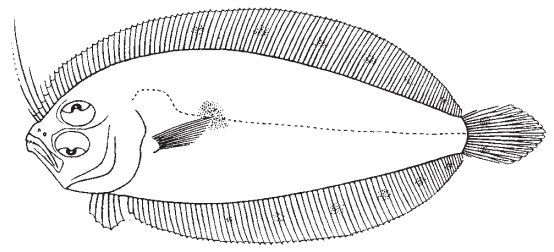


**Fig. 25**

- 3a. Dorsal-fin rays 83 to 98; anal-fin rays 65 to 77; lateral-line scales 48 to 60 (Fig. 26); a dark spot basally on posterior portions of dorsal and anal fins . . . . . *Arnoglossus macrolophus*
- 3b. Dorsal-fin rays 100 to 108, anal-fin rays 78 to 83; lateral-line scales 64 to 70 (Fig. 27); no dark spot basally on posterior portions of dorsal and anal fins . . . . . *Arnoglossus elongatus*

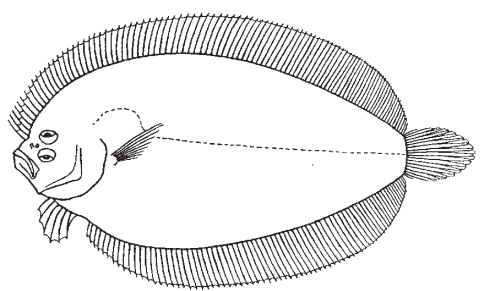


**Fig. 26 *Arnoglossus macrolophus***

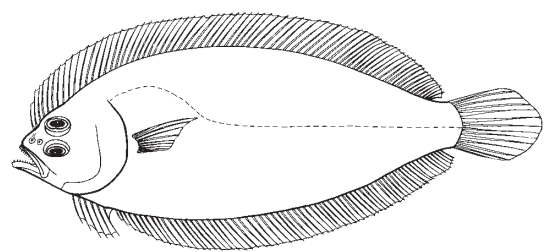


**Fig. 27 *Arnoglossus elongatus***

- 4a. Length of eye 4.2 to 5.1 times in head length . . . . . → 5
- 4b. Length of eye 3 to 4 times in head length . . . . . → 6
- 5a. Body depth 1.9 to 2.1 times in standard length; scales cycloid on eyed side; dorsal-fin rays 96 to 101; anal-fin rays 77 to 80 (Fig. 28) . . . . . *Arnoglossus fisoni*  
(presence in the area uncertain; unconfirmed report from the Bismarck Archipelago)
- 5b. Body depth 2.5 times in standard length; scales weakly ctenoid on eyed side; dorsal-fin rays 91; anal-fin rays 69 (Fig. 29) . . . . . *Arnoglossus tapeinosoma*



**Fig. 28 *Arnoglossus fisoni***



**Fig. 29 *Arnoglossus tapeinosoma***

- 6a. Dorsal-fin rays 80 to 84; anal-fin rays 61 to 64 (Fig. 30) . . . *Arnoglossus aspilos*
- 6b. Dorsal-fin rays 92 to 106; anal-fin rays 69 to 82 . . . . . → 7
- 7a. Body depth 2.3 to 2.9 times in standard length; dorsal-fin rays 92 to 98; anal-fin rays 69 to 77 (Fig. 31) . . . . . *Arnoglossus tenuis*
- 7b. Body depth 2.2 to 2.3 times in standard length; dorsal-fin rays 94 to 106; anal-fin rays 76 to 82 (Fig. 32) . . . . . *Arnoglossus waitei*

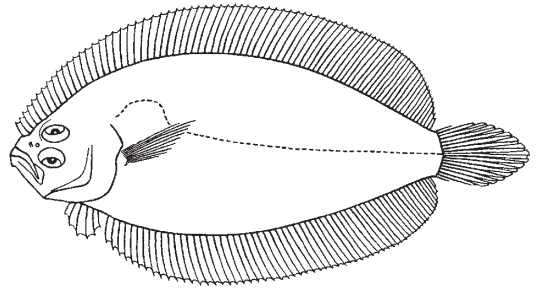


Fig. 30 *Arnoglossus aspilos*

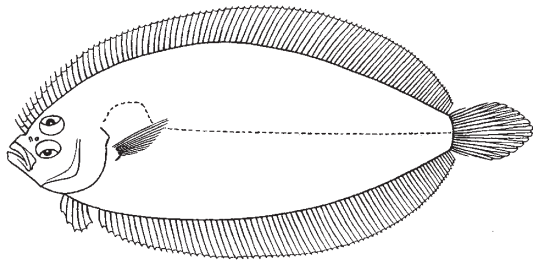


Fig. 31 *Arnoglossus tenuis*

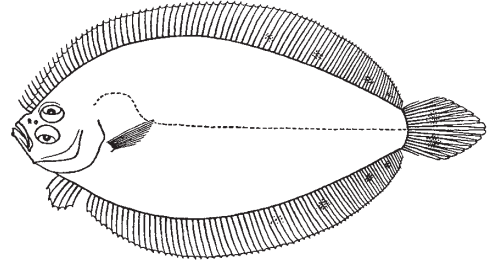


Fig. 32 *Arnoglossus waitei*

- 8a. Lateral-line scales 87 to 98 . . . . . → 9
- 8b. Lateral-line scales 63 to 86 . . . . . → 11
- 9a. Scales on eyed side cycloid; dorsal-fin rays 112 to 117; anal-fin rays 90 to 95 (Fig. 33) . . . *Arnoglossus debilis*
- 9b. Scales on eyed side ctenoid; dorsal-fin rays 108 to 113; anal-fin rays 84 to 89. . . . . → 10

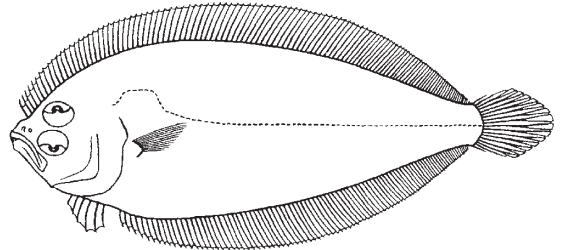


Fig. 33 *Arnoglossus debilis*

- 10a. Males with first 3 dorsal-fin rays elongate; distal end of pectoral fin on eyed side blackish in both sexes, somewhat lighter coloured in females (Fig. 34) . . . . . *Arnoglossus oxyrhynchus*  
(presence in the area uncertain; unconfirmed report from New Caledonia)
- 10b. Males without anterior dorsal-fin rays elongate; distal end of pectoral fin on eyed side not blackish (Fig. 35) . . . . . *Arnoglossus brunneus*

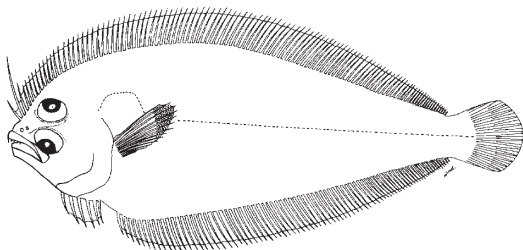


Fig. 34 *Arnoglossus oxyrhynchus*

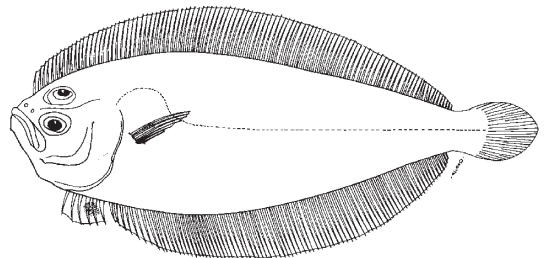


Fig. 35 *Arnoglossus brunneus*

11a. Upper jaw reaching to below about anterior third of lower eye; scales on eyed side ctenoid (Fig. 36) . . . . . *Arnoglossus polyspilus*

11b. Upper jaw reaching to below middle of lower eye or beyond middle of lower eye, length 2 to 2.7 times in head length; scales on eyed side cycloid (Figs 37 and 38) . . . . . → 12

12a. Upper jaw reaching to about middle of lower eye; lateral-line scales 63 to 73 (Fig. 37) . . . . . *Arnoglossus japonicus*

12b. Upper jaw reaching beyond middle of lower eye; lateral-line scales 70 to 86 (Fig. 38) . . . . . *Arnoglossus dalgleishi*

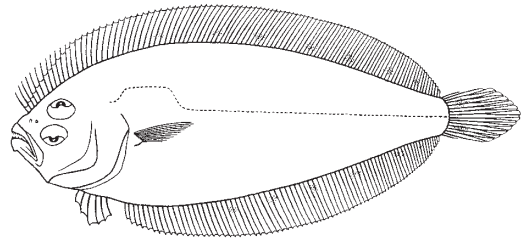


Fig. 36 *Arnoglossus polyspilus*

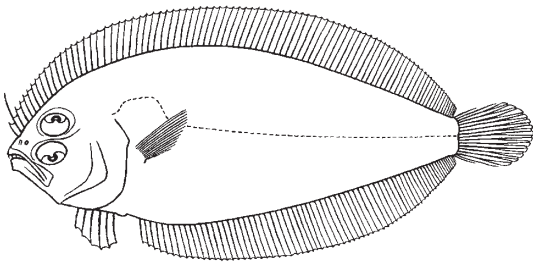


Fig. 37 *Arnoglossus japonicus*

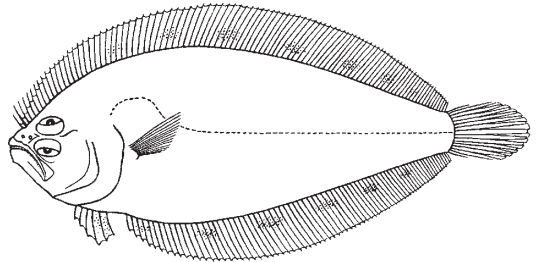


Fig. 38 *Arnoglossus dalgleishi*

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

1a. Body depth 1.7 to 1.9 times in standard length; interorbital width in head length in specimens larger than about 60 mm standard length 3.7 to 5.8 in males, 5.8 to 9 times in females; first dorsal-fin ray with distinct membranous structure at tip (Fig. 39) . . . . . *Asterorhombus fijiensis*

1b. Body depth 2 to 2.4 times in standard length; interorbital width in head length in specimens larger than about 60 mm standard length 13.6 to 31.2 times in both sexes; first dorsal-fin ray with broad, deeply indented, and branched membrane on distal two-thirds to three-thirds (Fig. 40) . . . . . *Asterorhombus intermedius*

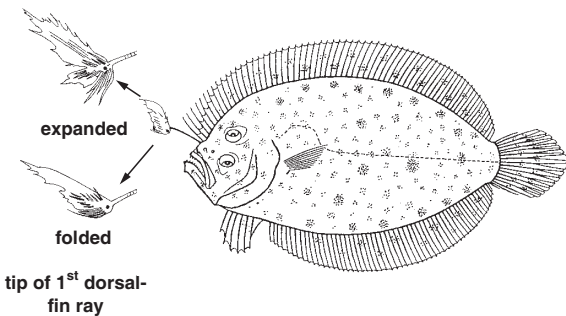


Fig. 39 *Asterorhombus fijiensis*

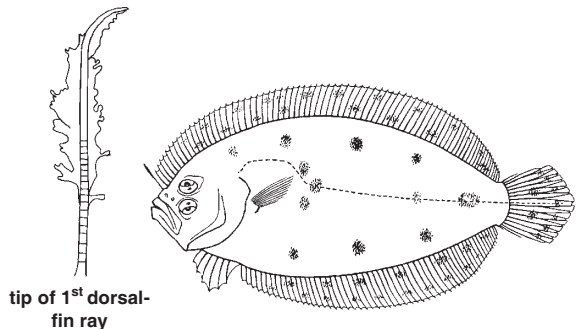


Fig. 40 *Asterorhombus intermedius*

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

- 1a. First gill arch with 9 to 11 gill rakers on lower limb; 96 to 104 dorsal-fin rays; 74 to 81 anal-fin rays (Fig. 41) . . . . . *Bothus mancus*
- 1b. First gill arch with 5 to 9 gill rakers on lower limb; 84 to 97 dorsal-fin rays; 61 to 73 anal-fin rays . . . . . → 2
- 2a. Scales on eyed side all cycloid except at upper and lower edges of body (Fig. 42) . . . . . *Bothus myriaster*
- 2b. Scales on eyed side ctenoid (Fig. 43) . . . . . *Bothus pantherinus*

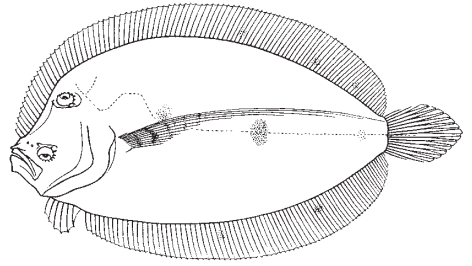


Fig. 41 *Bothus mancus*

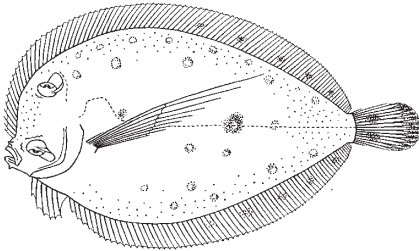


Fig. 42 *Bothus myriaster*

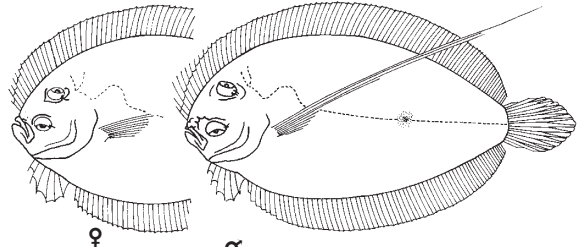


Fig. 43 *Bothus pantherinus*

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

- 1a. Caudal fin with dark cross bands (Fig. 44); length of pectoral fin on eyed side in males 1.3 to 1.5 times in head length; dark colour pattern on blind side in males pear-shaped (Fig. 45) . . . . . *Crossorhombus azureus*
- 1b. Caudal fin without dark cross bands; length of pectoral fin on eyed side in males 0.6 to 1.1 times in head length; dark colour pattern on blind side in males Y-shaped or posterior two-thirds of blind side dark . . . . . → 2

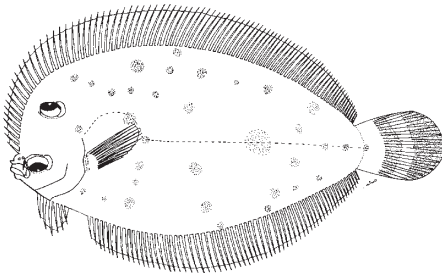


Fig. 44 *Crossorhombus azureus*

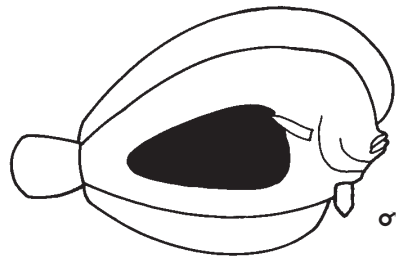


Fig. 45 blind side of body

- 2a. Length of pectoral fin on eyed side in males 0.6 to 0.7 times in head length (Fig. 46); length of pectoral fin on eyed side in females 0.8 to 0.9 times in head length; dark colour pattern on blind side in males covering posterior two-thirds of body (Fig. 47) . . . . . *Crossorhombus kobensis*  
(Japan and Formosa Strait; not yet recorded from the area)
- 2b. Length of pectoral fin on eyed side in males 0.9 to 1.1 times in head length (Fig. 48); length of pectoral fin on eyed side in females about 1.3 times in head length; dark colour pattern on blind side in males Y-shaped (Fig. 49) . . . . . *Crossorhombus howensis*  
(Taiwan Province of China and Lord Howe Island; not yet recorded from the area)

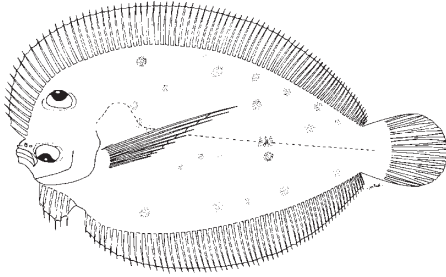


Fig. 46 *Crossorhombus kobensis*

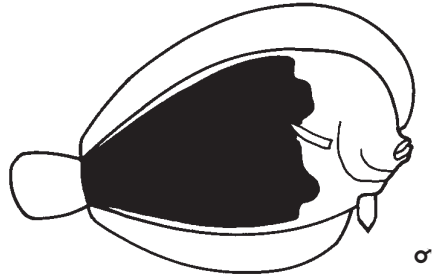


Fig. 47 blind side of body

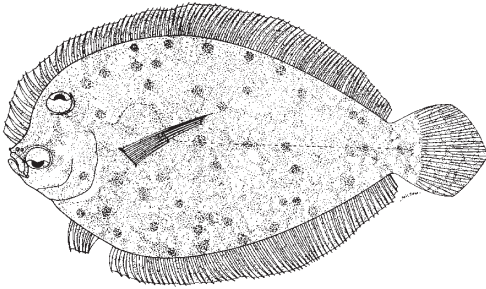


Fig. 48 *Crossorhombus kobensis*

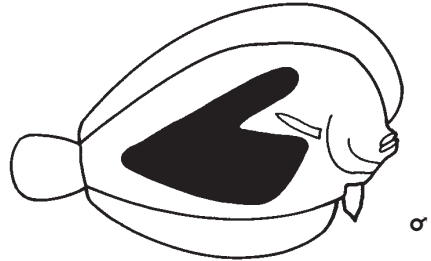


Fig. 49 blind side of body

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

- 1a. A pair of large jet-black blotches located submarginally on distal half of caudal fin . . . . . → 2
- 1b. Caudal fin with no blotches or a pair of dark blotches on basal third between fourth and seventh rays from dorsal and ventral margins of fin . . . . . → 3
- 2a. First gill arch with 5 to 8 gill rakers on lower limb; head margin in front of orbital region plain coloured; scales on head margin similar to body scales in length of ctenii and adhesion; blotches on caudal fin between second and fifth rays on dorsal and ventral margins of fin. . . . . *Engyprosopon grandisquama*
- 2b. First gill arch with more than 16 gill rakers on lower limb; a series of a few light blotches along head margin in front of orbital region; scales on head margin with stronger ctenii and less deciduous than body scales; blotches on caudal fin between third and sixth rays from dorsal and ventral margin of fin . . . . . *Engyprosopon xystrius*
- 3a. First gill arch with 14 or 15 gill rakers on lower limb . . . . . *Engyprosopon bellonaensis*
- 3b. First gill arch with less than 10 gill rakers on lower limb. . . . . → 4
- 4a. All gill rakers serrate on lower limb of first gill arch (Fig. 50a) . . . . . → 5
- 4b. All gill rakers not serrate on lower limb of first gill arch (Fig. 50b). . . . . → 8
- 5a. Pelvic-fin rays 7 at least on one side of body . . . . *Engyprosopon septempes*
- 5b. Pelvic-fin rays 6 on either side of body . . . . . → 6

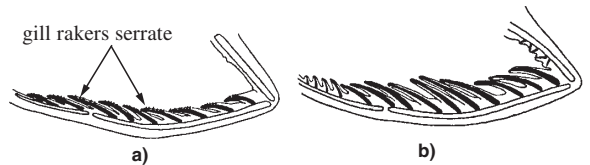
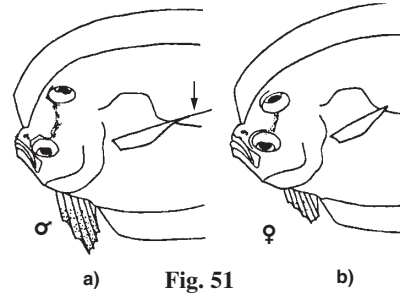


Fig. 50

- 6a. Pelvic fin on eyed side short (3.1 to 3.2 times in head length in both sexes) and with some black spots; pectoral-fin length on eyed side about twice as long as head in males, subequal to or more than head length in females; interorbital region uniformly coloured . . . . . *Engyprosopon longipterum*
- 6b. Pelvic fin on eyed side elongate (1.2 to 2.2 times in head length in males, 2.2 to 2.6 times in head length in females) and scattered with many black spots in males; pectoral-fin length on eyed side less than 1.2 times as long as head in males (Fig. 51a), less than 0.7 times as long as head in females (Fig. 51b); interorbital region with 1 or 2 dark cross bands . . . . . → 7



- 7a. Anal-fin rays 59 to 66; caudal fin short, 1.38 to 1.49 times in head length; scales in lateral line 38 to 41 . . . . . *Engyprosopon latifrons*  
(= *Engyprosopon obliquoculatum*)
- 7b. Anal-fin rays 67 to 76; caudal fin long, 1.15 to 1.33 times in head length; scales in lateral line 42 to 46 . . . . . *Engyprosopon rostratum*
- 8a. Teeth in upper jaw uniserial . . . . . → 9
- 8b. Teeth in upper jaw biserial . . . . . → 11
- 9a. Length of upper jaw 2.4 to 3.1 times in head length . . . . .  
. . . . . *Engyprosopon cocosensis*
- 9b. Length of upper jaw 2.2 to 2.4 times in head length . . . . . → 10

- 10a. Many dark spots and rings irregularly scattered on eyed side of body; both jaws and head margin in front of upper eye stained with dark markings; interorbital region generally with 2 dark cross bands; each eye with a flap in larger males; lower-jaw length on eyed side 13.1 to 15.7% of standard length (Fig. 52) . . . . . *Engyprosopon macrolepis*
- 10b. Head and body uniformly coloured, scarcely with spots and rings; eyes without flaps; lower-jaw length on eyed side 9.3 to 13% standard length. . . . . *Engyprosopon hureaui*

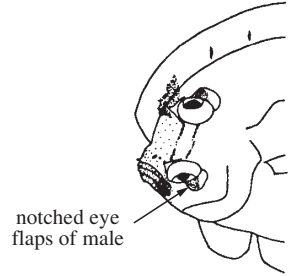


Fig. 52 *Engyprosopon macrolepis*

- 11a. Scales in lateral line less than 48; pectoral fin on eyed side longer than head length . . . . . *Engyprosopon maldivensis*
- 11b. Scales in lateral line more than 50 . . . . . → 12
- 12a. Dorsal-fin rays 78 to 86, anal-fin rays 58 to 62; gill rakers on lower limb 6 . . . *Engyprosopon mogkii*
- 12b. Dorsal-fin rays 90 to 91, anal-fin rays 68 to 74, gill rakers on lower limb 7 or 8 . . . . . *Engyprosopon bleekeri*  
(recently placed in genus *Asterorhombus*)

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

- 1a. Body depth 1.5 to 1.8 times in standard length; second to tenth dorsal-fin rays elongate (Fig. 53) . . . . .  
. . . . . *Grammatobothus polyophthalmus*
- 1b. Body depth 1.8 to 2 times in standard length; second to fourth rays elongate . . . . . → 2

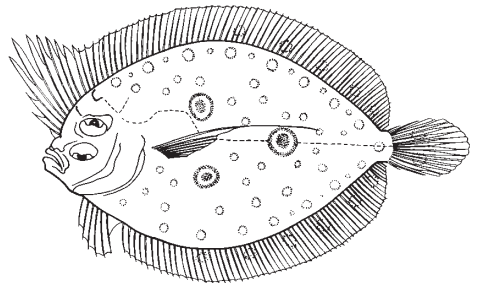


Fig. 53 *Grammatobothus polyophthalmus*

- 2a. Dorsal-fin rays 88 to 91; anal-fin rays 72 to 76 (Fig. 54) . . . . . *Grammatobothus pennatus*  
(presence in the area uncertain; unconfirmed report from New Caledonia)
- 2b. Dorsal-fin rays 82; anal-fin rays 66 (Fig. 55) . . . . . *Grammatobothus krempfi*

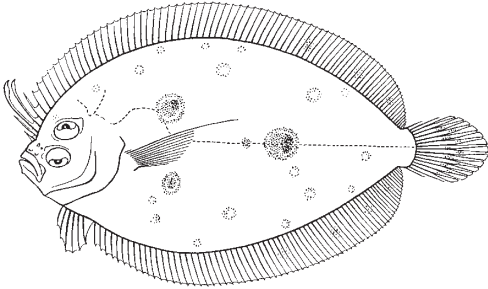


Fig. 54 *Grammatobothus pennatus*

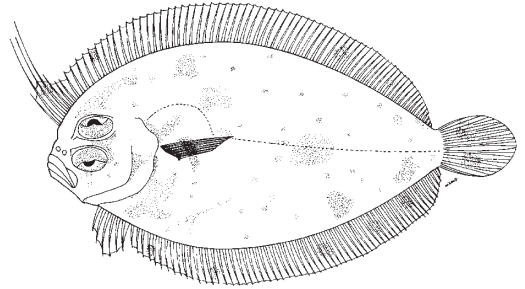


Fig. 55 *Grammatobothus krempfi*

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

- 1a. First ray of dorsal fin above anterior nostril of blind side; first 2 dorsal-fin rays not separated from remainder of fin; first through third dorsal-fin rays somewhat elongate (Fig. 56) . . . . . *Laeops nigromaculatus*  
(East Africa and Japan; not yet recorded from the area)
- 1b. First ray of dorsal fin above posterior nostril of blind side; first 2 dorsal-fin rays detached from remainder of fin; no dorsal-fin rays elongate . . . . . → 2
- 2a. Head length 5.7 times in standard length; 10 gill rakers on lower limb of first gill arch (Fig. 57) . . . . . *Laeops clarus*
- 2b. Head length 4.3 to 5.6 times in standard length; 6 to 9 gill rakers on lower limb of first gill arch . . . . . → 3

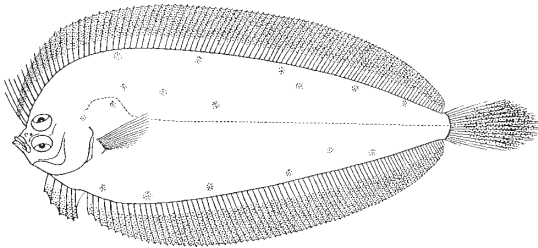


Fig. 56 *Laeops nigromaculatus*

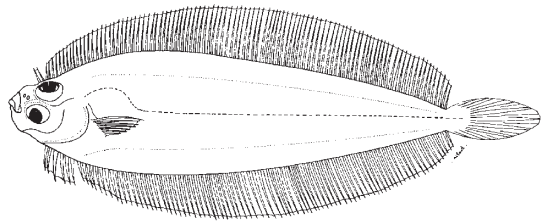


Fig. 57 *Laeops clarus*

- 3a. Dorsal-fin rays 112; anal-fin rays 93; body depth 3.2 times in standard length (Fig. 58) . . . . . *Laeops gracilis*
- 3b. Dorsal-fin rays 94 to 111; anal-fin rays 76 to 89; body depth 2.5 to 3 times in standard length . . . . . → 4

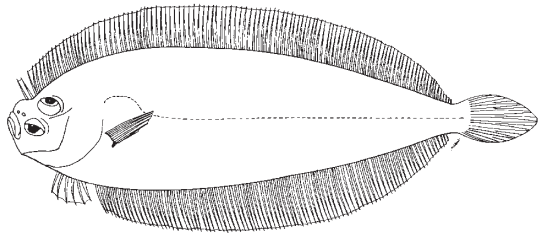


Fig. 58 *Laeops gracilis*

- 4a. Anal-fin rays 83 to 89; upper profile nearly straight above and behind eye (Fig. 59). . . . *Laeops parviceps*
- 4b. Anal-fin rays 76 to 81; upper profile convex above and behind eye (Fig. 60) . . . . *Laeops guentheri*

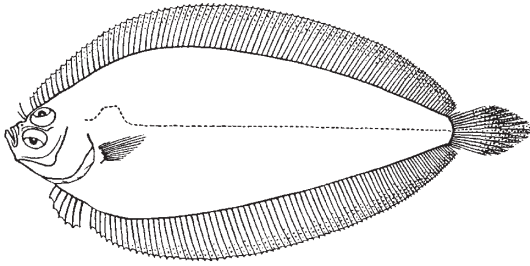


Fig. 59 *Laeops parviceps*

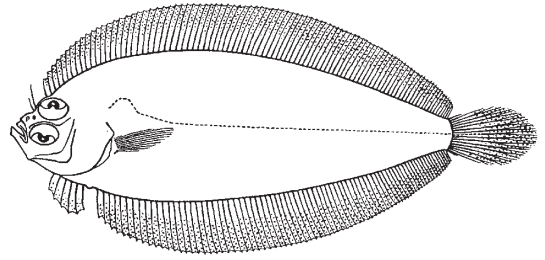


Fig. 60 *Laeops guentheri*

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

- 1a. Gill rakers serrate; pelvic fin on eyed side greatly elongate in males, its length more than 1/2 head length in males larger than 5 cm standard length (Fig. 61) . . . . . *Parabothus filipes*
- 1b. Gill rakers not serrate; pelvic fins not elongate in either sex, its length much less than 1/2 head length . . . . . → 2

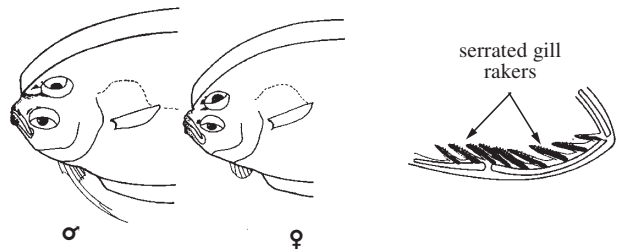


Fig. 61 *Parabothus filipes*

- 2a. Caudal fin darkened on middle rays; no conspicuous blotches on straight section of lateral line . . . . . *Parabothus kiensis*
- 2b. Caudal fin without distinct markings; 3 obscure dark blotches on lateral line . . . . . *Parabothus coarctatus*

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

- 1a. Dark spots along upper and lower edges of body not including bases of dorsal and anal fins; pectoral and caudal fins without blackish band . . . . . → 2
- 1b. Dark spots or blotches along upper and lower edges of body include basal parts of dorsal and anal fins; a dark patch on distal part of pectoral fin; distal part of caudal fin with a broad blackish band . . . . . → 3
- 2a. Pectoral fin with 5 rays on blind side; left pelvic fin very long, longest ray 1.7 to 1.8 times in head length . . . . . *Psettina profunda*
- 2b. Pectoral fin with 9 to 11 rays on blind side; length of left pelvic fin 2 to 3 times in head length . . . . . *Psettina gigantea*
- 3a. Head small, 3.7 to 4.4 times in standard length; first gill arch with 4 to 6 gill rakers on lower limb; scales in lateral line 53 to 61. . . . . *Psettina ijimai*
- 3b. Head large, 3.5 times in standard length; first gill arch with 7 or 8 gill rakers on lower limb . . . . . → 4
- 4a. Scales in lateral line 47 to 52 . . . . . *Psettina brevirectus*
- 4b. Scales in lateral line 72 . . . . . *Psettina variegatus*

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

- 1a. Lateral-line scales more than 80; usually 5 or 6 white blotches along head margin in mature specimens . . . . . *Tosarhombus neocaledonicus*
- 1b. Lateral-line scales less than 71 in lateral line; less than 5 white blotches along head margin . . . . . → 2
- 2a. Mouth large, upper-jaw length on eyed side 2.4 to 2.8 times in head length; in males, pectoral fin on eyed side greatly elongate and much longer than head (in females, not elongate and much shorter than head); body shallow (Fig. 62) . . . . . *Tosarhombus longimanus*
- 2b. Mouth small, upper-jaw length on eyed side 2.8 to 3.1 times in head length; pectoral fin on eyed side much less than head length in both sexes; body comparatively deep . . . . . *Tosarhombus brevis*

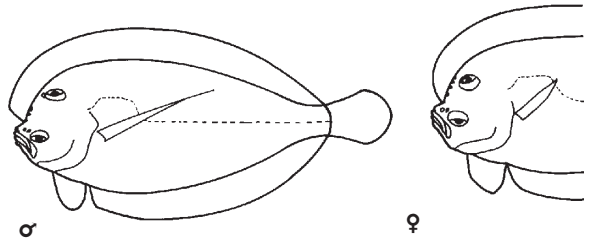


Fig. 62 *Tosarhombus longimanus*

**List of species occurring in the area**

The symbol is given when species accounts are included. A question mark indicates that presence in the area is uncertain.

- Arnoglossus aspilos* (Bleeker, 1851)
- Arnoglossus brunneus* (Fowler, 1934)
- Arnoglossus dalglishi* (Von Bonde, 1922)
- Arnoglossus debilis* (Gilbert, 1905)
- Arnoglossus elongatus* Weber, 1913
- ? *Arnoglossus fisoni* Ogilby, 1898
- Arnoglossus japonicus* Hubbs, 1915
- Arnoglossus macrolophus* Alcock, 1889
- ? *Arnoglossus oxyrhynchus* Amaoka, 1969
- Arnoglossus polyspilus* (Günther, 1880)
- Arnoglossus tapeinosomus* (Bleeker, 1866)
- Arnoglossus tenuis* Günther, 1880
- Arnoglossus waitei* Norman, 1926
- Asterorhombus fijiensis* (Norman, 1931)
- Asterorhombus intermedius* (Bleeker, 1866)
- Bothus mancus* (Broussonet, 1782)
- Bothus myriaster* (Temminck and Schlegel, 1846)
- Bothus pantherinus* (Rüppell, 1830)
- Chascanopsetta lugubris lugubris* Alcock, 1894
- Crossorhombus azureus* (Alcock, 1889)
- ? *Crossorhombus howensis* Hensley and Randall, 1993
- ? *Crossorhombus kobensis* (Jordan and Starks, 1906)
- Engyprosopon bellonaensis* Amaoka, Mihara, and Rivaton, 1993
- Engyprosopon bleekeri* (Macleay, 1882) (recently placed in genus *Asterorhombus*)
- Engyprosopon cocosensis* (Bleeker, 1855)
- Engyprosopon grandisquama* (Temminck and Schlegel, 1846)
- Engyprosopon hureaui* Quérou and Golani, 1990
- Engyprosopon latifrons* (Regan, 1908)
- Engyprosopon longipterum* Amaoka, Mihara, and Rivaton, 1993
- Engyprosopon macrolepis* (Regan, 1908)
- Engyprosopon maldivensis* (Regan, 1908)
- Engyprosopon mogkii* (Bleeker, 1854)

- *Engyprosopon rostratum* Amaoka, Mihara, and Rivaton, 1993
- *Engyprosopon septempes* Amaoka, Mihara, and Rivaton, 1993
- *Engyprosopon xystrias* Hubbs, 1915
- *Grammatobothus krempfi* Chabanaud, 1929
- ? *Grammatobothus pennatus* (Ogilby, 1913)
- *Grammatobothus polyophthalmus* (Bleeker, 1866)
- *Japonolaeops dentatus* Amaoka, 1969
- *Kamoharaia megastoma* (Kamohara, 1936)
- *Laeops clarus* Fowler, 1934
- *Laeops gracilis* Fowler, 1934
- *Laeops guentheri* Alcock, 1890
- ? *Laeops nigromaculatus* Von Bonde, 1922
- *Laeops parviceps* Günther, 1880
- *Lophonectes gallus* Günther, 1880
- *Neolaeops microphthalmus* (Von Bonde, 1922)
- *Parabothus coarctatus* (Gilbert, 1905)
- *Parabothus filipes* Amaoka, Mihara, and Rivaton, 1997
- *Parabothus kiensis* (Tanaka, 1918)
- *Psettina brevirectus* (Alcock, 1890)
- *Psettina gigantea* Amaoka, 1963
- *Psettina ijimai* (Jordan and Starks, 1904)
- *Psettina profunda* (Weber, 1913)
- *Psettina variegatus* (Fowler, 1934)
- ? *Taeniopsetta ocellata* (Günther, 1880)
- *Tosarhombus brevis* Amaoka, Mihara, and Rivaton, 1997
- *Tosarhombus longimanus* Amaoka, Mihara, and Rivaton, 1997
- *Tosarhombus neocaledonicus* Amaoka and Rivaton, 1991

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