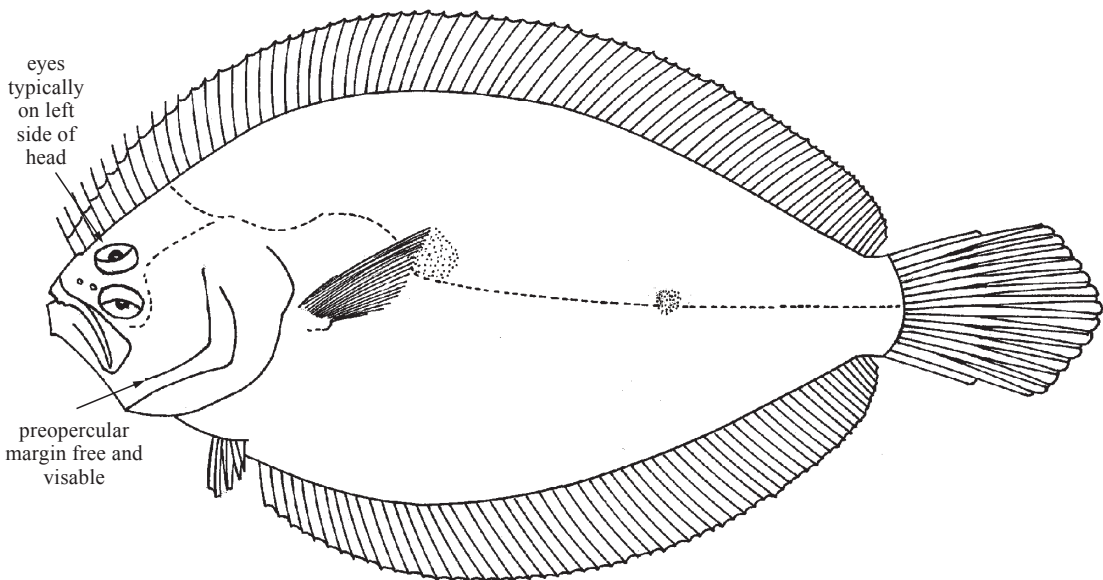


PARALICHTHYIDAE

Sand flounders

by T.A. Munroe, National Marine Fisheries Service, National Museum of Natural History, Washington D.C., USA

D **Diagnostic characters:** Most species with eyes on left side of head, reversals frequent in some species (right-eyed individuals nearly as common as left-eyed in some species occurring outside the Atlantic). No spines present in fins. Mouth protractile, asymmetrical, lower jaw moderately prominent; teeth in jaws sometimes canine-like; no teeth on vomer. **Preopercle exposed, its posterior margin free and visible, not hidden by skin or scales.** Urinary papilla on ocular side (*Paralichthys* group) or blind side (*Cyclopsetta* group), not attached to first anal-fin ray. Dorsal fin long, originating above, lateral to, or anterior to upper eye. **Dorsal and anal fins not attached to caudal fin. Both pectoral fins present. Both pelvic fins present, with 5 or 6 rays (6 rays in nearly all species); base of pelvic fin of ocular side on midventral line (*Cyclopsetta* group), or pelvic fins symmetrically or nearly symmetrically placed on either side of midventral line (base of neither pelvic fin on midventral line) (*Paralichthys* group).** Caudal fin with 17 or 18 rays, 10 to 13 rays branched (usually 11 or 13, rarely 10 or 12). Lateral line present and obvious on both sides of body; lateral line with (*Paralichthys* group) or without (*Cyclopsetta* group) high arch over pectoral fin; lateral line present (*Paralichthys* group) or absent (*Cyclopsetta* group) below lower eye. Some species of the *Cyclopsetta* group (some species of *Syacium*, *Citharichthys*, and possibly *Etropus* in this area) show sexual dimorphism in interorbital width, length of the pectoral fin on the ocular side, length of the anterior dorsal-fin rays, and coloration. **Colour:** ocular side uniformly brownish or greyish, often with spots, blotches, or ocelli; blind side usually pale; although ambicoloration (eyed-side coloration replicated on blind side) may occasionally occur.

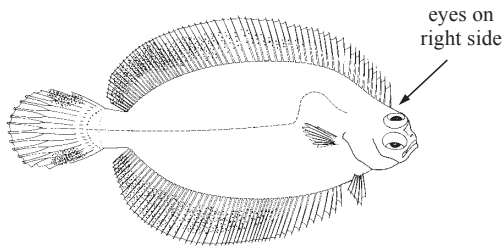


Habitat, biology, and fisheries: Sand flounders are bottom-dwelling predators, usually burrowing partially or almost entirely in sand or soft mud. They are capable of a rapid change in coloration which allows them to match their background almost perfectly. Most appear to feed on or near the bottom, but some of the larger species will rise off the bottom to capture prey. Most occur in shallow water, although some species also occur at slope depths (greater than 200 m). Most paralichthyid flounders are good foodfishes, but many species occurring in Fishing Area 31 are too small to be considered of significant economic importance. Nearly all species are only of subsistence economic importance. Separate statistics for most species of paralichthyid flounders are not reported from the area. Major exceptions are the larger species of *Paralichthys*, which support commercial and recreational fisheries. Within the area, USA landings reported for 1995 of *Paralichthys* spp. was 1 926 t. Fishing methods for paralichthyids are trawling, seining, and hook-and-line. Species are used fresh, frozen, and for making fish meal.

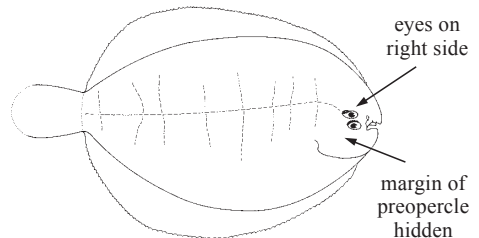
Similar families occurring in the area

Pleuronectidae and Poecilopsettidae: both eyes usually on right side of head; lateral line present below lower eye (present in *Paralichthys* group, absent in *Cyclopsetta* group); pelvic fins with short bases and symmetrically placed on either side of midventral line (similar in *Paralichthys* group, left pelvic fin on midventral line in *Cyclopsetta* group); urinary papilla on ocular side (ocular side in *Paralichthys* group, on blind side in *Cyclopsetta* group).

Achiridae: both eyes usually on right side of head; margin of preopercle hidden beneath skin and scales; lateral line without high arch over pectoral fin (high arch over pectoral fin present in *Paralichthys* group, absent in *Cyclopsetta* group); 5 pelvic-fin rays; urinary papilla on ocular side (ocular side in *Paralichthys* group, on blind side in *Cyclopsetta* group).



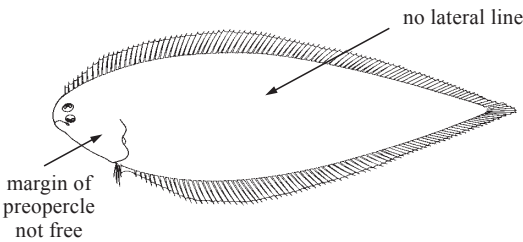
Poecilopsettidae



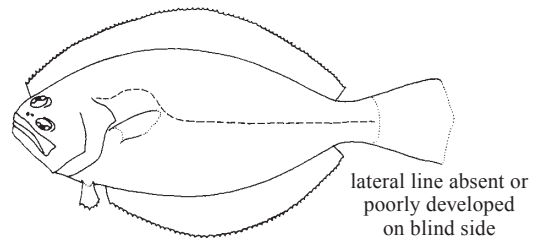
Achiridae

Cynoglossidae: margin of preopercle not free (hidden beneath skin and scales); pectoral fins absent in adults; lateral line absent on both sides of body; dorsal and anal fins joined to caudal fin; no branched caudal-fin rays; urinary papilla on midventral line attached to first anal-fin ray.

Bothidae: lateral line absent or poorly developed on blind side; lateral line absent below lower eye (present in *Paralichthys* group, absent in *Cyclopsetta* group); lateral line of ocular side with high arch over pectoral fin (high arch over pectoral fin present in *Paralichthys* group, absent in *Cyclopsetta* group); pelvic fin of ocular side on midventral line (on midventral line in *Cyclopsetta* group, not on midventral line in *Paralichthys* group); urinary papilla on ocular side (on ocular side in *Paralichthys* group, on blind side in *Cyclopsetta* group).



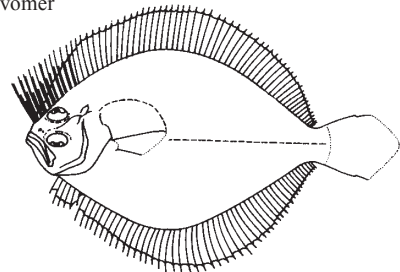
Cynoglossidae



Bothidae

Scophthalmidae: eyes usually on left side of head; both pelvic fins elongate, placed close to midline and extending forward to urohyal; pelvic fins free from anal fin, with first ray of blind-side fin opposite second or third ray of ocular-side fin; lateral line equally developed on both sides of body, with strong arch above pectoral fin, and with distinct supratemporal branch (high arch over pectoral fin present in *Paralichthys* group, absent in *Cyclopsetta* group); urinary papilla on ocular side (on ocular side in *Paralichthys* group, on blind side in *Cyclopsetta* group); small patch of teeth on vomer.

teeth on vomer



Scophthalmidae

Key to the species of Paralichthyidae occurring in the area

- 1a. Lateral line distinctly arched above pectoral fin on ocular side (Fig. 1) and prolonged below inferior eye; pelvic fins symmetrically or nearly symmetrically placed on either side of midventral line (base of neither pelvic fin on midventral line); urinary papilla on ocular side; branched caudal-fin rays 13 (*Paralichthys* group) → 2
- 1b. No distinct arch in lateral line above pectoral fin on ocular side (Fig. 2) and lateral line not prolonged below inferior eye; base of pelvic fin on ocular side on midventral line; urinary papilla on blind side; branched caudal-fin rays 11, rarely 10 or 12 (*Cyclopsetta* group) → 14

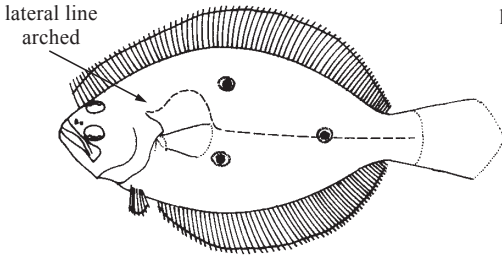


Fig. 1 *Paralichthys*

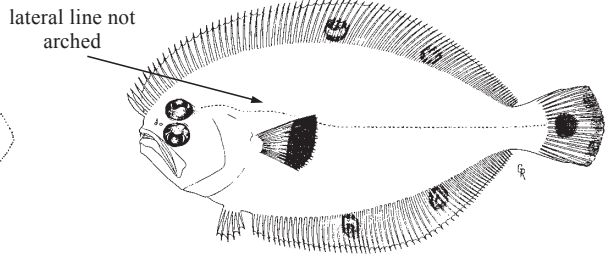


Fig. 2 *Cyclopsetta*

- 2a. Pelvic-fin rays of ocular side in adults longer than rays of blind side; anterior rays of dorsal fin in adults prolonged beginning with second ray (except *Ancylopsetta kumperae*); 3 or 4 large, ocellated, dark spots on body (when only 3 ocelli present, arrangement is either with 1 above pectoral fin and 2 at midbody, one above the other, dorsal and ventral to lateral line; or with posteriormost ocellus dorsoventrally oval or elliptical and situated on lateral line just before caudal peduncle; when 4 ocelli present, anteriormost positioned above arch in lateral line); lower-limb gill rakers on first arch 6 to 9; dorsal-fin rays 62 to 84 → 3
- 2b. Pelvic-fin rays of ocular side not longer than rays of blind side; anterior rays of dorsal fin not prolonged; large, ocellated, dark spots present or absent on body (when ocelli present, not arranged as above); lower-limb gill rakers on first arch 7 to 18; dorsal-fin rays 71 to 104 → 9
- 3a. Origin of dorsal fin well in advance of eyes (Fig. 3); dorsal profile of head smoothly convex; scales on ocular side cycloid and embedded; dorsal-fin rays 58 to 65; 3 ocelli on ocular side, 1 above pectoral fin and 2 at midbody, one above the other, dorsal and ventral to lateral line. *Gastropsetta frontalis*
- 3b. Origin of dorsal fin over or slightly anterior to front of eyes (Fig. 4); dorsal profile of head with a concavity in front of upper eye; scales on eyed side ctenoid (ctenii microscopic on 2 species); dorsal-fin rays 62 to 84; 3 or 4 ocelli on ocular side, not arranged as above (*Ancylopsetta*) → 4

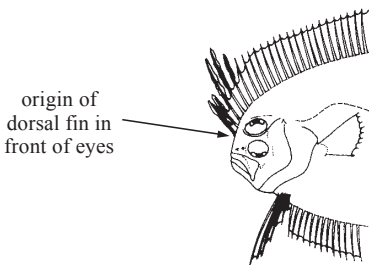


Fig. 3 *Gastropsetta*

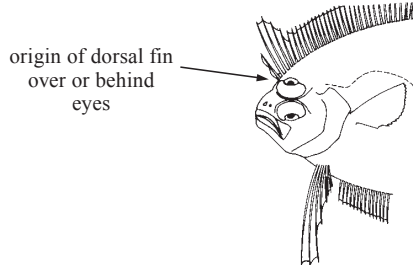


Fig. 4 *Ancylopsetta*

- 4a. Four large ocellated spots on ocular side; anterior spot above curved portion of lateral line, posterior ocelli arranged in triangle with 2 (one above the other) in midbody and the third located on the lateral line caudally → 5
- 4b. Three large ocellated spots arranged in triangular pattern on ocular side, with posterior ocellus on lateral line; no spot above curved portion of lateral line → 6

- 5a. Dark ocellated spot on distal portion of pelvic fin on ocular side; no anterior dorsal-fin rays longer than succeeding rays; centres of ocelli dark; inner rays of ocular-side pelvic fin extensively branched; blind side dusky. *Ancylosetta kumperae*
- 5b. No dark ocellated spot on distal portion of ocular-side pelvic fin; some anterior dorsal-fin rays slightly elongate, longer than succeeding rays; centres of ocelli generally whitish (difficult to discern in larger individuals); inner rays of ocular-side pelvic fin not extensively branched; blind side immaculate *Ancylosetta quadrocellata*

- 6a. Scales on ocular side rough to the touch; ctenii well developed, projecting beyond scale margin → 7
- 6b. Scales on ocular side smooth to the touch; ctenii microscopic, not well developed, not projecting beyond scale margin → 8

- 7a. First 2 dorsal-fin rays short, next 3 long (may be longer or shorter than head), succeeding rays short and of about equal length; no prominent fleshy projections on tips of anterior dorsal-fin rays; blind side dusky, but less noticeable on some large specimens; 29 to 34 dorsal-fin rays between origin of fin and centre of dorsal ocellus *Ancylosetta antillarum*
- 7b. First dorsal-fin ray short, second or third longest (never longer than head), succeeding rays gradually decreasing in length through sixth or seventh ray; prominent fleshy projections on tips of some anterior dorsal-fin rays; blind side immaculate; 38 to 46 dorsal-fin rays between origin of fin and centre of dorsal ocellus *Ancylosetta dilecta*

- 8a. First 2 dorsal-fin rays short, next 2 long; no prominent fleshy projections on tips of anterior dorsal-fin rays; blind side dusky; ocular-side pelvic fin in adults less than twice length that of blind side *Ancylosetta microctenus*
- 8b. First dorsal-fin ray short, next 3 long; prominent fleshy projections on tips of anterior dorsal-fin rays; blind side immaculate; ocular-side pelvic fin in adults may be more or less than twice length that of blind side *Ancylosetta cycloidea*

- 9a. Prominent ocelli on ocular side → 10
- 9b. No prominent ocelli on ocular side → 12

- 10a. Eyes relatively large and close set, nearly meeting, separated only by a narrow ridge (Fig. 5); lower-limb gill rakers 7 to 11; lateral-line scales 63 to 95; 4 large dark ocelli on ocular side of body, arranged in a trapezoid with 2 in midbody (one above the other on opposite sides of the lateral line) and 2 on the body (one above the other on opposite sides of the lateral line) at a point slightly anterior to caudal peduncle; dorsal-fin rays 71 to 86; anal-fin rays 58 to 72 *Hippoglossina oblonga*
- 10b. Eyes separated by a flat space without a ridge (Fig. 6); lower-limb gill rakers 8 to 18; lateral-line scales 85 to 117; 3 or 5 prominent ocelli on ocular side not arranged as above; dorsal-fin rays 71 to 96; anal-fin rays 53 to 74 → 11

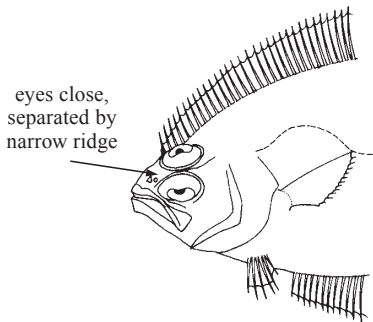


Fig. 5 *Hippoglossina*

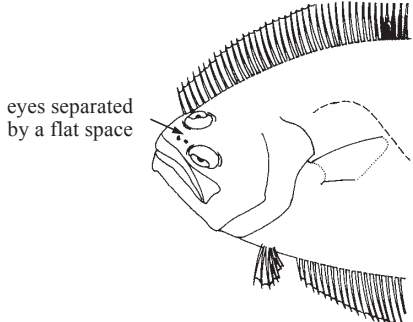


Fig. 6 *Paralichthys*

- 11a. Many ocelli on ocular side, but with 5 prominent ocellated dark spots on posterior half of body; gill rakers on lower limb of first arch 14 or more (rarely 13); dorsal-fin rays 80 to 96; anal-fin rays 61 to 73; 91 to 106 scales in lateral line; vertebrae 11 precaudal and 30 or 31 caudal *Paralichthys dentatus*
- 11b. Three prominent ocellated dark spots on body arranged in a triangle with 2 (one above the other) in midbody and 1 on the lateral line in posterior part of body; gill rakers on lower limb of first arch 9 to 12; dorsal-fin rays 71 to 85; anal fin rays 53 to 63; 78 to 81 scales in lateral line; vertebrae 10 precaudal and 27 caudal *Paralichthys albigutta*

- 12a. Body depth greater than 47% standard length (mean 50% standard length); blind side on larger specimens dusky; 104 to 117 scales in lateral line *Paralichthys squamilentus*
- 12b. Body depth 47% or less standard length (mean 44% standard length); blind side immaculate or dusky; 78 to 100 scales in lateral line → 13

- 13a. Anal-fin rays 57 to 64; dorsal-fin rays 73 to 80; gill rakers on lower limb of first arch 10 to 13; 64 to 68 scales on straight portion of lateral line *Paralichthys tropicus*
- 13b. Anal-fin rays 64 or more (occasionally 63); dorsal-fin rays 80 to 95; gill rakers on lower limb of first arch 8 to 11; 57 to 68 scales in straight portion of lateral line *Paralichthys lethostigma*

- 14a. Mouth small, maxilla 3.5 to 4.2 in head length nearly reaching vertical through front margin of eye (Fig. 7); jaws on blind side arched; no enlarged teeth, front teeth in both jaws equal in size to lateral teeth (*Etropus*) → 15
- 14b. Mouth large, maxilla less than 3.5 in head length usually reaching posteriorly to vertical through mideye (Fig. 8); jaws on blind side not arched; front teeth in jaws enlarged, larger than lateral teeth → 19

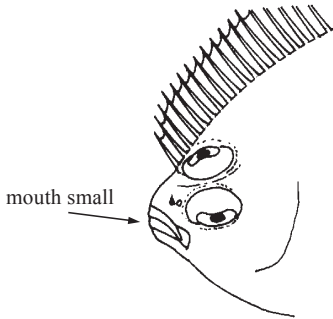


Fig. 7 *Etropus*

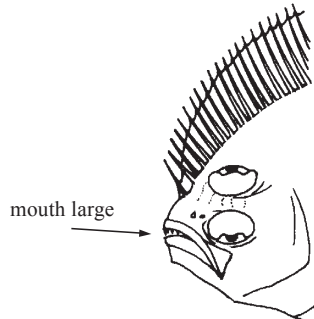


Fig. 8 *Syacium*

- 15a. Accessory scales absent; gill rakers on lower limb of first arch 6 to 9, modally 7 or 8; without scales on snout → 16
- 15b. Accessory scales present; gill rakers on lower limb of first arch 3 to 6 (rarely 7); with scales on snout → 17

- 16a. Body depth 50 to 58% in standard length; gill rakers on lower limb of first arch 6 to 9 (usually 7 or 8); often with dark margin on caudal fin *Etropus crossotus*
- 16b. Body depth 40 to 45% in standard length; gill rakers on lower limb of first arch 6 or 7; without dark margin on caudal fin *Etropus delsmanni*

- 17a. Mandible relatively symmetrical; accessory scales cover 1/2 or less of exposed surface of primary scales in fish larger than about 60 mm standard length; greatest body depth usually less than 50% standard length; number of gill rakers on upper limb of first arch usually equal to or less than number on lower limb. *Etropus microstomus*
- 17b. Mandible not symmetrical; accessory scales cover 3/4 of exposed surface of primary scales in fish larger than about 60 mm standard length; greatest body depth usually more than 50% standard length; number of gill rakers on upper limb of first arch usually exceeds number on lower limb → 18

- 18a. Snout with scales forward of a line between ocular- and blind-side nostrils in fishes greater than 30 mm standard length; ctenii on snout scales highly modified, especially in large males; primary scales of blind side ctenoid, but ctenii may be indistinct on fish less than 50 mm standard length; without dark circles on ocular side *Etropus rimosus*
- 18b. Snout without scales forward of a line between ocular- and blind-side nostrils in fishes greater than 30 mm standard length, or rarely, with 1 or 2 scales present in large specimens; ctenii on snout scales simple; primary scales of blind side cycloid; often with row of four to six small dark circles on ocular side above and below lateral line, but circles may be indistinct on fish collected over dark substrate *Etropus cyclosquamus*

- 19a. Upper jaw with 2 rows of fixed (immovable) teeth (*Syacium*) → 20
- 19b. Both jaws with a single row of fixed (immovable) teeth → 27

- 20a. Body depth usually 48% standard length or greater (45 to 47% on some specimens from the Caribbean); interorbital width of adults large (dimorphic differences as well as ontogenetic differences, but usually greater than that in *Syacium papillosum* and *Syacium micrurum* of comparable size; Table 1); 46 to 55 scales in lateral line; dorsal-fin rays 74 to 85; anal-fin rays 59 to 68 *Syacium gunteri*
- 20b. Body depth usually 45% standard length or less (rarely 47%); 44 to 69 scales in lateral line; dorsal-fin rays 82 to 94; anal-fin rays 64 to 75. → 21

Table 1. Comparison of relative size of interorbital space (expressed as percent of diameter of lower eye) for size ranges and both sexes of 3 species of *Syacium* occurring in the area of interest.


Species	Range of Standard Length (mm)		Percent of Lower Eye Diameter	
	Males	Females	Males	Females
<i>S. gunteri</i>	80-90	80-90	25-40	20-35
<i>S. gunteri</i>	91-100	91-98	35-55	25-40
<i>S. gunteri</i>	>101		>55	
<i>S. papillosum</i>	80-100	80-100	<20	<20
<i>S. papillosum</i>	>101	>101	15-40	10-25
<i>S. micrurum</i>	80-100	80-100	<20	<20
<i>S. micrurum</i>	>101	>101	15-40	10-25

- 21a. Specimens greater than 120 mm standard length → 22
- 21b. Specimens less than 120 mm standard length → 26














- 22a.** Interorbital width greater than 75% of lower eye diameter; anterior rays of pectoral fin on ocular side elongate, exceeding 25% standard length; pigment lines (bluish in life, brown after preservation) running anteroventrally from upper eye, may also be present on interorbital region, lips, mandible, and urohyal; blind side dusky **male *Syacium papillosum***
- 22b.** Interorbital width less than 75% of lower eye diameter → **23**
- 23a.** Ocular-side pectoral-fin rays not elongate, less than 25% standard length (females) → **24**
- 23b.** Ocular-side pectoral-fin rays elongate, greater than 25% standard length (males) → **25**
- 24a.** Interorbital width 25 to 35% of lower eye diameter in specimens 120 to 150 mm standard length, increasing to 60% in specimens about 220 mm standard length; general body colour dark brown, little or no mottling **female *Syacium papillosum***
- 24b.** Interorbital width about 20% of lower eye diameter in specimens 120 to 150 mm standard length, increasing to about 27% in specimens to 195 mm standard length; general body colour light tan to brown, mottling on body and fins, several large black blotches on lateral line **female *Syacium micrurum***
- 25a.** Interorbital width usually 30 to 70% of lower eye diameter in specimens 120 to 150 mm standard length, 50 to 90% in specimens 150 to 180 mm standard length, and exceeding 75% of lower eye diameter in larger specimens **male *Syacium papillosum***
- 25b.** Interorbital width less than 35% of lower eye diameter in specimens 120 to 150 mm standard length, less than 50% in specimens 150 to 180 mm standard length, and never exceeding 75% of lower eye diameter **male *Syacium micrurum***
- 26a.** Snout length 54 to 74% (mean 66%) of shortest distance from tip of snout to orbit of upper eye; interorbital width generally greater than 15% of lower eye diameter ***Syacium papillosum***
- 26b.** Snout length 80 to 92% (mean 83%) of shortest distance from tip of snout to orbit of upper eye; interorbital width generally less than 15% of lower eye diameter ***Syacium micrurum***
- 27a.** Scales ctenoid; gill rakers slender and moderately long (***Citharichthys***) → **28**
- 27b.** Scales cycloid; gill rakers stout and short (***Cyclosetta***) → **37**
- 28a.** Osseous protuberance on snout; upper-jaw length less than 33% head length (31% head length in some specimens of *C. spilopterus*); body depth 34 to 43% standard length (usually less than 40%) ***Citharichthys arcifrons***
- 28b.** No osseous protuberance on snout (but males may have labial and cephalic spination); upper-jaw length usually greater than 33% head length; body depth greater than 40% standard length → **29**
- 29a.** Eighteen to 24 long and slender gill rakers on lower limb of first arch; snout completely covered with scales; cephalic spination on males, absent on females; mature males with extremely blunt head ***Citharichthys amblybregmatus***
- 29b.** Fewer than 18 gill rakers on lower limb of first arch; snout only partially covered with scales or naked; cephalic spination present or absent; mature males with rounded head → **30**
- 30a.** Dorsal-fin rays 88 or more; anal-fin rays 68 or more; lower jaw noticeably included in upper jaw when mouth closed; with several large canines overhanging lower jaw; caudal fin with or without 2 large spots; if spots present, arranged one above and one below median rays ***Citharichthys dinoceros***
- 30b.** Dorsal-fin rays fewer than 88; anal-fin rays fewer than 68; lower jaw not noticeably included in upper jaw when mouth closed; without conspicuous canines overhanging lower jaw; caudal fin without large spots, or with numerous spots → **31**

- 31a.** Body and median fins profusely covered with regularly arranged spots and blotches (scales deciduous, spotting on body not so obvious when scales lost) *Citharichthys macrops*
- 31b.** Body and median fins not profusely covered with regularly arranged spots and blotches → 32
- 32a.** Eye diameter usually 30% head length or greater; cephalic spination present on males, absent on females → 33
- 32b.** Eye diameter 25% head length or less; no cephalic spination → 34
- 33a.** Snout partially covered with scales; ocular-side pelvic fin with 6 fin rays; scales in lateral line 40 or more; small dark spot in axil of pectoral fin (males without large black spot on middle of dorsal and anal fins); mature males with single horizontally directed spine projecting forward from snout region between eyes and extending well beyond margin of head *Citharichthys cornutus*
- 33b.** Snout naked; ocular-side pelvic fin with 5 fin rays; scales in lateral line fewer than 40; no dark spot in axil of pectoral fin (males with dark black spot on dorsal and anal fins immediately behind longest rays); males with anterior continuation of spine from rim of orbit of upper eye directed horizontally and projecting forward beyond margin of head *Citharichthys gymnorhinus*
- 34a.** Dorsal-fin rays about 68; anal-fin rays about 52; scales in lateral line 52 to 55 (known only from type collected off the coast of Haiti, may be conspecific with *Citharichthys arenaceus*) *Citharichthys uhleri*
- 34b.** Dorsal-fin rays 68 to 84; anal-fin rays 48 to 63; scales in lateral line 42 to 50 → 35
- 35a.** Body depth usually less than 45% standard length; interorbital space narrow, filled almost entirely by bony ridge; ventral profile of head angular; body thickness (measured at midbody at vertical through midpectoral fin) usually less than 5% standard length; dark spot usually present on caudal peduncle near caudal-fin base; upper first arch gill rakers 3 to 5; caudal vertebrae 23 to 25, usually 23 or 24. *Citharichthys spilopterus*
- 35b.** Body depth usually greater than 45% standard length; interorbital space wider, not completely filled by bony ridge; ventral profile of head rounded; body thickness usually greater than 5% standard length; diffuse spot present or absent on caudal peduncle near caudal-fin base; upper first arch gill rakers 3 to 8; caudal vertebrae 21 to 23, usually 21 or 22 → 36
- 36a.** Upper-jaw length 39 to 44% head length (mean 41%); length of first dorsal-fin ray 22 to 29% head length (mean 24); total gill rakers on first arch 15 to 21 (mean 18); body thickness in adults about 6.3 to 8.0% of standard length; upper first arch gill rakers 3 to 7, usually 4 to 6; caudal vertebrae 21 to 23, usually 22 or 23; West Indies to Brazil . *Citharichthys arenaceus*
- 36b.** Upper-jaw length 35 to 39% head length (mean 37%); length of first dorsal-fin ray 24 to 31% head length (mean 28); total gill rakers on first arch 18 to 23 (mean 21); body thickness in adults 4.0 to 6.5% of standard length; upper first arch gill rakers 5 to 8, usually 5 to 7; caudal vertebrae 21 to 23, usually 21 or 22; Western Gulf of Mexico from Veracruz south to Campeche, Mexico *Citharichthys abbotti*
- 37a.** Large black spot in centre of caudal fin; 3 smaller spots on distal margin of caudal fin (may be present or absent); large black blotch on distal margin of ocular-side pectoral fin, but without black blotch on body under this fin; distal margin of pectoral fin truncate; ocular-side pectoral-fin rays 11 or 12 *Cyclopsetta fimbriata*
- 37b.** No large spot in centre of caudal fin; 3 distinct spots on distal margin of caudal fin; no blotch on distal margin of ocular-side pectoral fin, but with large black blotch on body under this fin; distal margin of pectoral fin oblique; ocular-side pectoral-fin rays 14 to 16 . *Cyclopsetta chittendeni*


















List of species occurring in the area

The symbol  is given when species accounts are included.

Paralichthys group

-  *Ancylosetta antillarum* Gutherz, 1966.
-  *Ancylosetta cycloidea* Tyler, 1959.
-  *Ancylosetta dilecta* (Goode and Bean, 1883).
-  *Ancylosetta kumperae* Tyler, 1959.
-  *Ancylosetta microctenus* Gutherz, 1966.
-  *Ancylosetta quadrocellata* Gill, 1864.
-  *Gastropsetta frontalis* Bean, 1895.
-  *Hippoglossina oblonga* (Mitchill, 1815).
-  *Paralichthys albigutta* Jordan and Gilbert, 1882.
-  *Paralichthys dentatus* (Linnaeus, 1766).
-  *Paralichthys lethostigma* Jordan and Gilbert, 1884.
-  *Paralichthys squamilentus* Jordan and Gilbert, 1882.
-  *Paralichthys tropicus* Ginsburg, 1933.

Cyclopsetta group

- Citharichthys abbotti* Dawson, 1969. Size to 15 cm SL. W Gulf of Mexico from Veracruz to Campeche, Mexico.
-  *Citharichthys amblybregmatus* Gutherz and Blackman, 1970.
-  *Citharichthys arctifrons* Goode, 1880.
-  *Citharichthys arenaceus* Evermann and Marsh, 1900.
-  *Citharichthys cornutus* (Günther, 1880).
-  *Citharichthys dinoceros* Goode and Bean, 1886.
-  *Citharichthys gymnorhinus* Gutherz and Blackman, 1970.
-  *Citharichthys macrops* Dresel, 1885.
-  *Citharichthys spilopterus* Günther, 1862.
-  *Citharichthys uhleri* Jordan in Jordan and Goss, 1889.
-  *Cyclopsetta chittendeni* Bean, 1895.
-  *Cyclopsetta fimbriata* (Goode and Bean, 1885).
-  *Etropus crossotus* Jordan and Gilbert, 1882.
-  *Etropus cyclosquamus* Leslie and Stewart, 1986.
- Etropus delsmanni* Chabanaud, 1940. Size 6 cm; Venezuela. (May not be valid.)
- Etropus microstomus* (Gill, 1864). Size to 12 cm SL. New York to North Carolina, occasional strays S to Florida.
-  *Etropus rimosus* Goode and Bean, 1885.
-  *Syacium gunteri* Ginsburg, 1933.
-  *Syacium micrurum* Ranzani, 1840.
-  *Syacium papillosum* (Linnaeus, 1758).

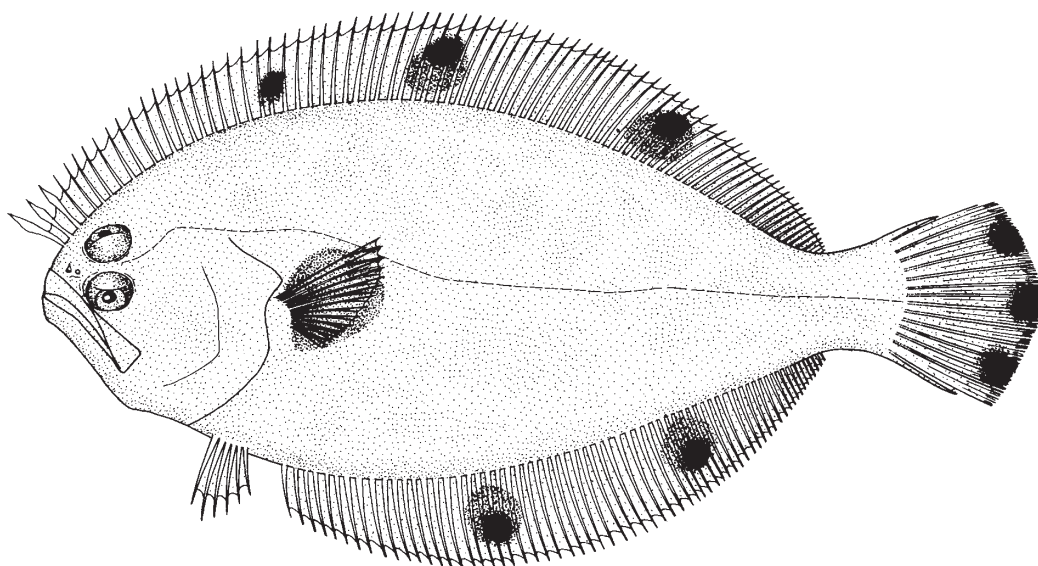
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Cyclopsetta chittendeni Bean, 1895

Frequent synonyms / misidentifications: *Cyclopsetta decussata* Gunter, 1946 / None.

FAO names: En - Mexican flounder; Fr - Perpeire; Sp - Lenguado aleta manchada.



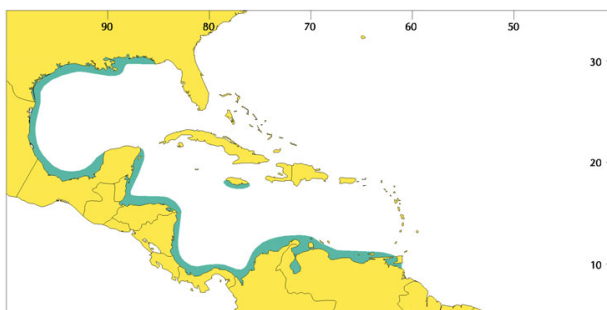
Diagnostic characters: Body oval, moderately elongate (body depth 2.1 to 2.5 in standard length). Dorsal profile of head evenly convex. Eyes not large; eye diameter 5.0 to 5.9 in head length; interorbital space narrow, less than half eye diameter. **Mouth large and oblique; maxilla extending beyond vertical through posterior margin of eyes. Jaws with large canine-like teeth. Lower limb of first gill arch with 8 to 9 gill rakers.** Dorsal-fin rays 82 to 90. Dorsal-fin origin distinctly anterior to vertical through anterior margin of eyes. **Ocular-side pectoral-fin rays 14 to 16.** Anal-fin rays 63 to 69. Caudal fin rounded. **Scales cycloid; 74 to 80 in lateral line. Ocular-side lateral line not steeply arched above pectoral fin. Colour: brown with large dark blotch beneath pectoral fin. Dorsal and anal fins with row of dark spots containing pale areas, 2 spots on dorsal fin and with a few large spots on anal fin. Caudal fin with 3 large dark spots at posterior border, none on centre of fin.**

Size: Maximum to about 33 cm total length; common to 25 cm.

Habitat, biology, and fisheries: Inhabits the inner continental shelf from 18 to 150 m. Length frequency plots of monthly collections off Louisiana suggest a growth rate of 13.7 mm/month for Age-0 fish and 8.5 mm/month for Age-1 fish. Taken in fisheries principally from Louisiana to Mexico. Separate statistics not reported for this species. Regarded as the most common large flatfish taken by shrimp trawlers off the Texas coast. Most of the catch is processed frozen, but fresh fish occasionally appears in markets.

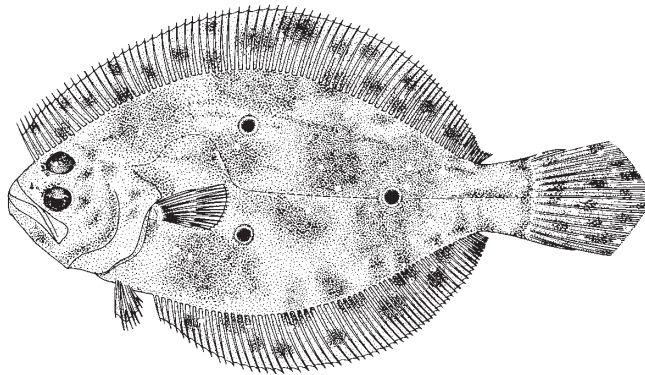
Distribution: Northern and western Gulf of Mexico, Jamaica, western and southern shores of the Caribbean to Trinidad, and south to Guarujá, São Paulo State, Brazil.

Remarks: *Cyclopsetta decussata* Gunter, 1946 is a junior synonym of *C. chittendeni*.



Paralichthys albigutta (Jordan and Gilbert, 1882)

YSB

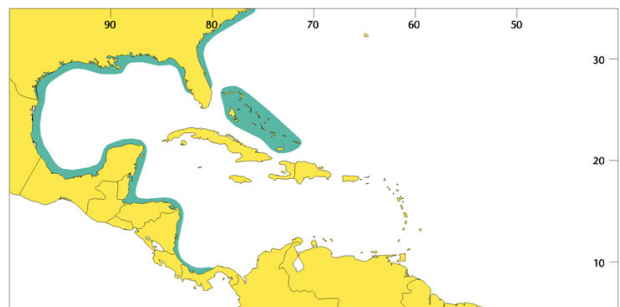
Frequent synonyms / misidentifications: None / None.**FAO names:** **En** - Gulf flounder; **Fr** - Cardeau trois yeux; **Sp** - Lenguado tres ojos.

Diagnostic characters: Body oval, moderately elongate (body depth 2.1 to 2.6 in standard length). Dorsal profile of head straight. Eye diameter 4.8 to 6.0 in head length; interorbital space flat and narrow (smaller than eye diameter). Mouth large; maxilla extending to or beyond vertical through posterior margin of lower eye. Jaws with single series of strong canine-like teeth. Lower limb of first gill arch with 9 to 12 gill rakers. Dorsal-fin rays 71 to 86. Dorsal-fin origin about equal with vertical through nostrils. Pectoral-fin rays 10 to 12; pectoral-fin rays short (tip not reaching to straight portion of lateral line on ocular side). Anal-fin rays 53 to 63. Scales small, cycloid; 78 to 81 scales on lateral line. Ocular-side lateral line forming steep arch above pectoral fin. Colour: ocular side brown, varying in tone with the substrate; with numerous spots and blotches and 3 prominent ocellated dark spots forming a triangle (a spot above and below lateral line and third spot on middle of straight portion of lateral line); spots may be faint in adults.

Size: Maximum to 71 cm; common to 35 cm.

Habitat, biology, and fisheries: Inhabits mainly hard, sandy bottoms on the inner continental shelf from 19 to 130 m. Juveniles inhabit high salinity seagrass systems. Unable to tolerate salinities below 20 ‰. Adults migrate offshore to spawn in late autumn and winter and re-enter bays during April to July. Inshore collections in northwestern Florida were dominated by individuals 0 to 2 yrs of age, whereas offshore collections consisted mostly of individuals of 2 to 8 yrs of age, perhaps indicating that once individuals migrate to offshore waters, they become increasingly resident offshore as they age. Spawning occurs offshore in the Gulf of Mexico at depths of 20 to 60 m during late autumn and winter; highest spawning frequency observed during late-October to mid-December, with spawning activity tapering off in February. Larvae and young migrate inshore during January and February with February being the month of maximum immigration (water temperatures about 16°C). Females mature by age 2; size at 50% maturity is 35 to 38 cm total length. Males attain maturity at 30 to 35 cm total length. Females grow faster and attain larger sizes than do males. Longevity for males is reported as 8 to 11 yrs, however, maximum age in collections is commonly cited as only 2 yrs. Longevity for females is reported as 7 yrs, however maximum age in collections is commonly cited as only 3 yrs. Feeds primarily on amphipods, mysids and other small crustaceans at smaller sizes (less than 5 cm total length); at larger sizes feeds primarily on fish. Taken in fisheries along continental shelf off the east coast of the USA and in the northern Gulf of Mexico. In 1995, Gulf coast recreational landings were mostly this species. Separate statistics not reported for this species. Caught mainly with trawls; also with trammel nets. Marketed fresh and frozen; a good foodfish, but not of great commercial importance.

Distribution: North Carolina to Florida, Gulf of Mexico and western Caribbean to Panama. A few records from the Bahamas, but not yet recorded from the Antilles.

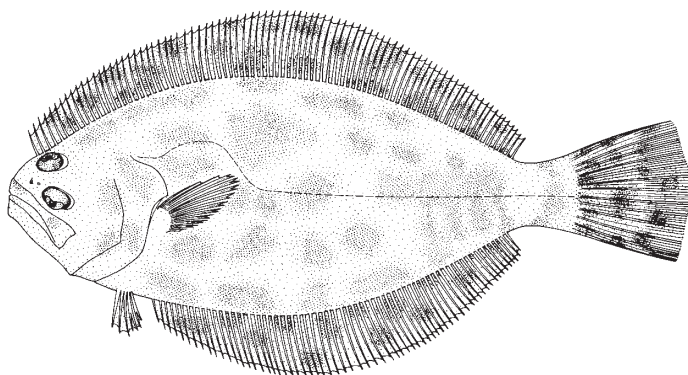


Paralichthys lethostigma Jordan and Gilbert, 1884

YSH

Frequent synonyms / misidentifications: None / None.

FAO names: **En** - Southern flounder; **Fr** - Cardeau de Floride; **Sp** - Lenguado de Florida.

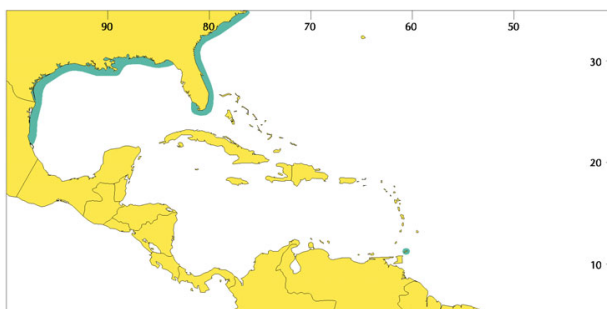


Diagnostic characters: Body oval, moderately elongate (body depth 2.1 to 2.6 in standard length). Dorsal profile of head slightly concave above eyes. Eyes relatively small; eye diameter 5.2 to 6.7 in head length; interorbital space flat and about as wide as eye diameter. Mouth large; maxilla extending posteriorly beyond vertical through posterior margin of lower eye. Jaws with strong, canine-like teeth. Gill rakers shorter than eye diameter; 8 to 11 on lower limb of first arch. Dorsal-fin rays 80 to 95. Dorsal-fin origin slightly anterior to vertical through anterior margin of upper eye. Ocular-side pectoral-fin rays 11 to 13. Anal-fin rays 63 to 74. Scales small, cycloid; 85 to 100 on lateral line. Ocular-side lateral line forming steep arch above pectoral fin. **Colour:** ocular side olive brown with diffuse, dark, non-ocellated spots and blotches (spots tending to disappear in large individuals). Blind side immaculate or dusky.

Size: Maximum to 77 cm; common to 60 cm.

Habitat, biology, and fisheries: Found over soft sediments (mud, clay, silt) in estuaries and coastal waters to about 40 m, adults also entering rivers. Occurs over wide temperature and salinity ranges. Spends most of summer in brackish waters, moving to deeper marine waters for spawning in autumn and winter. Temperatures below about 7°C in saltwater are considered fatal for adults; optimal temperature for maximum growth in North Carolina estuaries is greater than 30°C. Inshore-offshore movement patterns of adults are related to spawning activities. Juveniles are found in Atlantic estuaries when temperatures are as low as 2 to 4°C; juveniles begin to immigrate into Texas bays when water temperatures are as low as 14°C, with peak immigration occurring when water temperatures average 16°C. Adults that had migrated to the Gulf to spawn began to re-enter Texas bays as early as February to April. Males begin to migrate offshore before females. Males grow slower than females and reach about half the size of females. Spawns offshore in the Gulf of Mexico at depths of 20 to 60 m (but in winter individuals have been found at depths of 140 m in the South Atlantic Bight) during autumn and winter (September to April) when about 2 yrs old; peak spawning occurs from November to January. A voracious predator feeding chiefly on fishes (onset of piscivory ca. 70 mm total length), also on crabs and shrimps; juveniles take mainly small benthic invertebrates. This species is the dominant large paralichthyid flounder in the muddier western Gulf of Mexico. Captured along east coast of the USA, and November-April in northern Gulf of Mexico. Commonly taken by shrimp trawlers. Separate statistics not reported for this species; but in 1974 to 1975 this species consistently accounted for over 95% of total catch in Aransas Bay, Texas. Commercial and recreational landings of *Paralichthys* along Louisiana coasts for 1997 were estimated to be 43 038 kg and 144 947 kg respectively. Caught mainly with shrimp trawls, trammel nets, beach seines, spears, hook-and-line. Marketed mostly fresh.

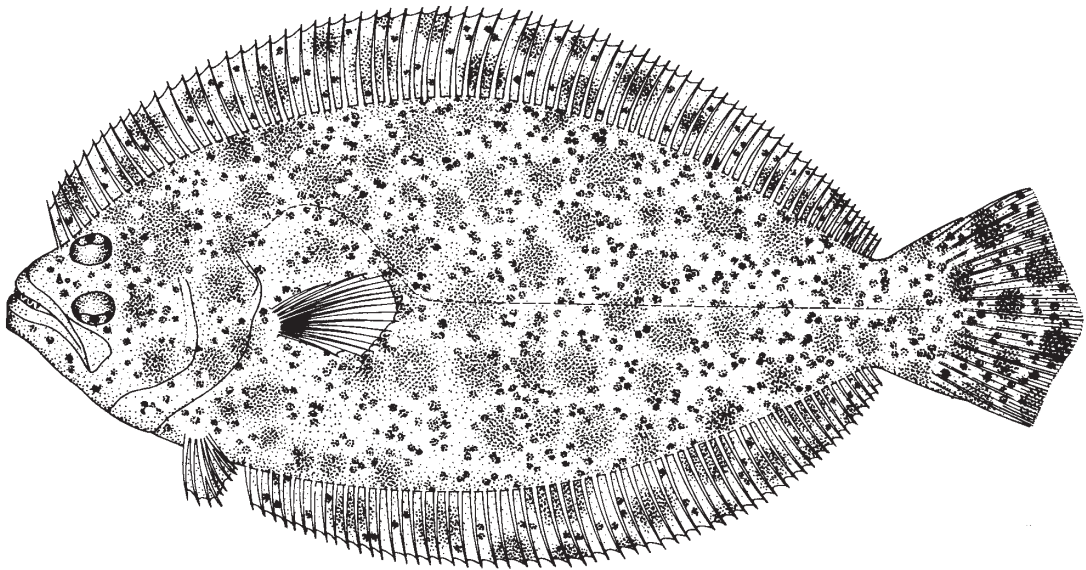
Distribution: Atlantic and Gulf coasts of the USA, from North Carolina to Texas; northern Mexico (reported from Tobago in literature, but this record appears to be in error).



***Paralichthys tropicus* Ginsburg, 1933**

Frequent synonyms / misidentifications: None / None.

FAO names: **En** - Tropical flounder; **Fr** - Cardeau tropical; **Sp** - Lenguado criollo.

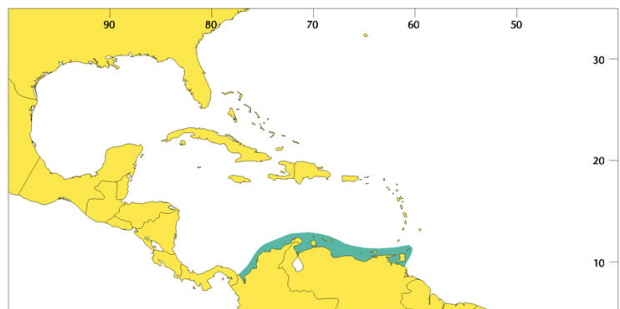


Diagnostic characters: Body oval, moderately elongate (body depth 2.1 to 2.3 in standard length). Dorsal profile of head slightly concave; snout moderately pointed. Eye diameter 4.0 to 6.0 in head length; interorbital space flat and narrow (smaller than eye diameter). Mouth large and oblique; maxilla extending posteriorly to vertical through posterior margin of lower eye. Jaws with single series of canine-like teeth. Lower limb of first gill arch with 10-13 gill rakers. Dorsal-fin rays 69-80. Dorsal-fin origin slightly anterior to vertical through anterior margin of upper eye. Ocular-side pectoral-fin rays 11; pectoral-fin tip nearly reaching to anterior end of straight portion of lateral line. Anal-fin rays 57 to 64. Caudal fin slightly double emarginate. Scales cycloid; 95 to 98 on lateral line. Ocular-side lateral line forming steep arch above pectoral fin. **Colour:** brown with diffuse, rounded, non-ocellated dark blotches (about as large as eyes) scattered over entire side, including fins, along with smaller dark and light spots.

Size: Maximum to at least 50 cm; common to 30 cm.

Habitat, biology, and fisheries: Found over muddy and sandy bottoms from inshore waters to depths of 183 m. Incidentally caught in the southern Caribbean. Separate statistics not reported for this species. Caught mainly with bottom trawls; occasionally with beach seines, hand lines, and spears. Marketed fresh occasionally. Although the species is common and the flesh of good quality, it has little commercial importance at the present time.

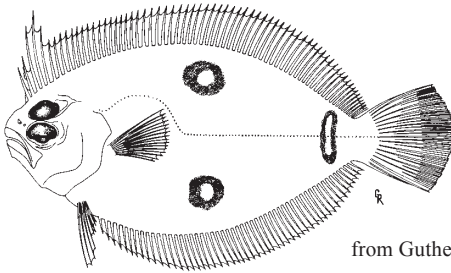
Distribution: Shoreline seas of the southern Caribbean from Colombia and Venezuela to Trinidad and Tobago. Other species of *Paralichthys* are not known from the southern Caribbean Sea.



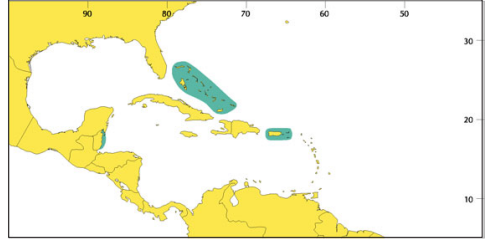
***Ancylopsetta antillarum* Guthertz, 1966**

En - Antilles flounder.

Maximum size to 30 cm standard length. Occurring at depths of 200 to 500 m. Caribbean (Bahamas, Puerto Rico, Virgin Islands; Belize).



from Guthertz, 1967

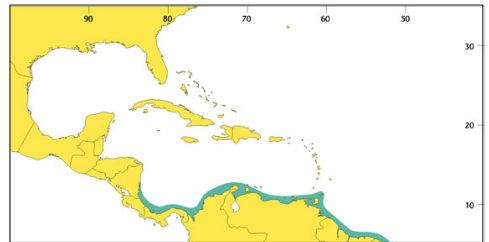
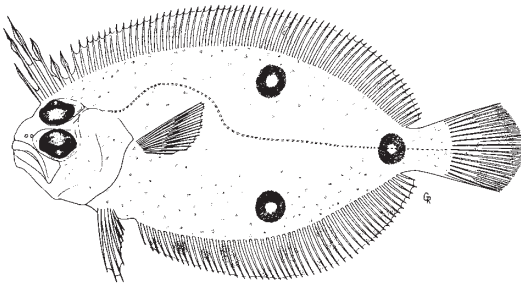


***Ancylopsetta cycloidea* Tyler, 1959**

NYL

En - Cyclope flounder; **Fr** - Rombou cyclope; **Sp** - Lenguado de tres manchas.

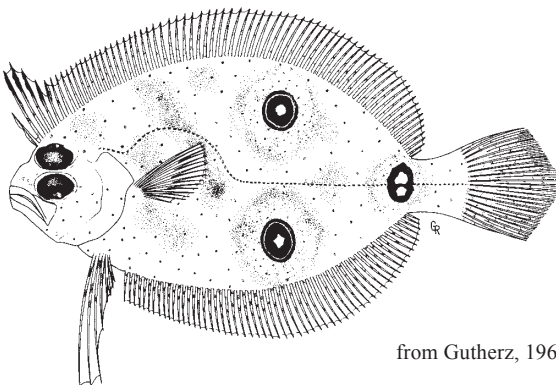
Maximum size 25 cm, common to 20 cm. On soft bottoms of the continental shelf between depths of 70 and 260 m. Taken as bycatch in industrial trawl fisheries for shrimp and finfishes. Marketed fresh. Atlantic Ocean from Trinidad and Tobago to the Guyanas, Suriname, and Brazil; Caribbean Sea from southern Nicaragua to Venezuela.



***Ancylopsetta dilecta* (Goode and Bean, 1883)**

En - Three-eye flounder.

Maximum size to 25 cm. Occurring at depths of 50 to 370 m. Atlantic and Gulf coasts of the USA from North Carolina to Yucatán, Mexico; Tobago.



from Guthertz, 1967

