

Diagnosis and description: Body completely covered with small imbricate scales; head partly naked; snout depressed; eyes small, more than 6 times in head length; spine on opercle sharp and needle-like; maxilla expanded posteriorly, not sheathed, with a ventrally directed pointed process near the posteroventral angle; both granular and needle-like teeth; palatine teeth present; tongue with an anterior prow-like extension; developed gill rakers on first arch 3 or 4; branchiostegal rays 7; lateral line marked by free papillae; male intromittent organ lacking ossified parts; pelvic fin with a single ray in each; pectoral-fin rays 11 to 14, fin mounted on a peduncle that is broader than long; caudal-fin rays 4 to 6; precaudal vertebrae 11 or 12.

Revisions: Cohen and Wourms (1976).

Geographical distribution: Widely distributed throughout the tropical Indo-Pacific from the Gulf of Aden to Hawaii, but apparently absent from the eastern Pacific.

Habitat and biology: Tiny secretive reef fishes collected at 1 to 38 m. Nowhere very abundant.

Interest to fisheries: None.

Size: Largest known specimen is the holotype of *Microbrotula randalli* at 42 mm. A female specimen of *M. randalli* is gravid at 38 mm.

Key to species

- 1a. Eye diameter 6.4 to 8.4 in head length; interorbital width 10.7 to 13.7 in head length *M. randalli*
- 1b. Eye diameter 11.0 to 15.4 in head length; interorbital width 3.6 to 4.2 in head length *M. rubra*

List of species

Microbrotula randalli Cohen and Wourms, 1976. Samoa and Vanuatu at 30 to 38 m near reef-sand interface. Rare.

M. rubra Gosline, 1953. Oahu, Hawaii at 1 m over mixed coral and sand. Rare.

Remarks: There are several undescribed species in the Indo-Pacific region.

Pseudonus Garman, 1899

Type species: *Pseudonus acutus* Garman, 1899 by monotypy.

Synonyms: None.

Number of recognized species: 3.

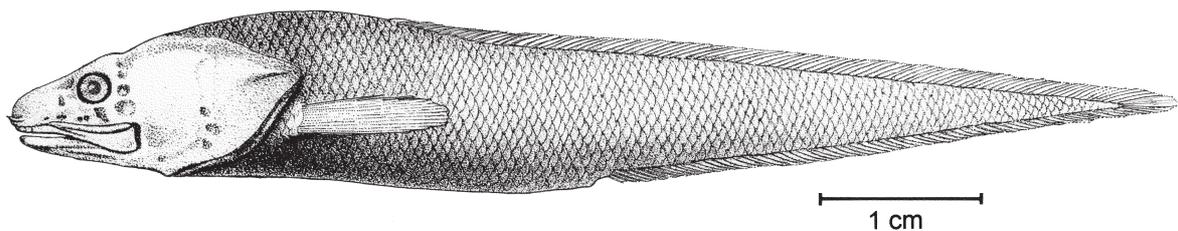


Fig. 106 *Pseudonus acutus* (from Garman, 1899)

Diagnosis and description: Head depressed, partly naked; eyes dorsolaterally directed; opercular spine strong; teeth present on palatines; developed rakers on first arch 3; branchiostegal rays 8 or 9; head pores large and prominent, a large elliptical median interorbital pore; cleithrum with a sharp-pointed spine projecting posteriorly dorsal to the upper pectoral-fin ray; pelvic fins absent or with a single ray in each; pectoral-fin rays 18 to 22; caudal-fin rays 7 to 9; pectoral fins on a fleshy lobe that is broader than long; precaudal vertebrae 15 or 16.

Revisions: None.

Geographical distribution: Gulf of Aden, Arabian Sea, the Philippines, and Gulf of Panama.

Habitat and biology: The few known specimens have been caught on the continental slope with bottom trawls fishing a soft bottom.

Interest to fisheries: None.

Size: At least 130 mm.

Key to species

- 1a. Pelvic fins absent *P. acutus*
 1b. Pelvic fins present → 2
- 2a. Interorbital width 8.4 to 10.4 in head length *P. squamiceps*
 2b. Interorbital width 7.2 in head length *P. platycephalus*

List of nominal species

Pseudonus acutus Garman, 1899. Gulf of Panama; caught in bottom trawls at 915 to 1 620 m. Rare.
P. platycephalus (Smith and Radcliffe in Radcliffe, 1913) (possibly a junior synonym of *P. squamiceps*). Philippines; caught in bottom trawls fishing at 763 m and 1281 m on soft bottom. Rare.
P. squamiceps (Lloyd, 1909) (possibly a senior synonym of *P. platycephalus*). Gulf of Aden and Arabian Sea; caught in bottom trawls at 915 to 990 m on a soft bottom. Rare.

Saccogaster Alcock, 1889

Type species: *Saccogaster maculata* Alcock, 1889 by monotypy.

Synonyms: *Barbuliceps* Chan, 1966. Type species *Barbuliceps tubercularis* Chan, 1966 (apparently an error for *tuberculatus*).

Number of recognized species: 8.

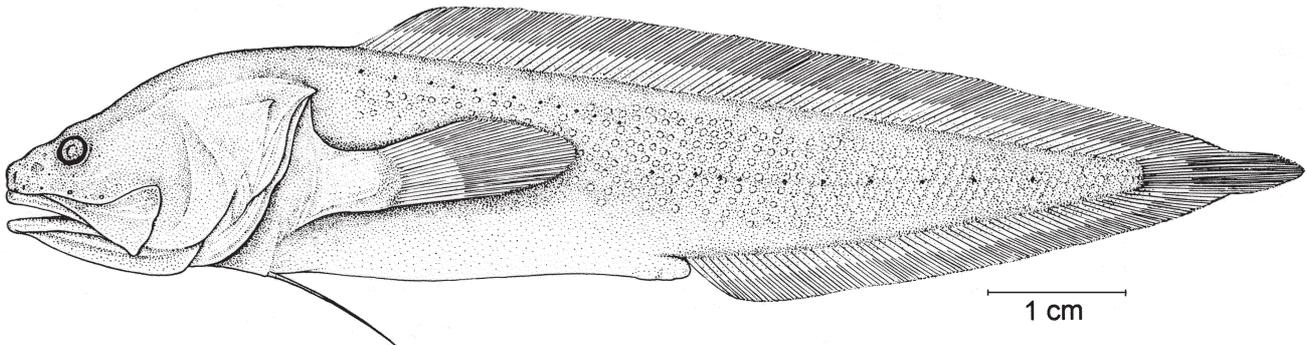


Fig. 107 *Saccogaster maculata* (from Cohen and Nielsen, 1972)

Diagnosis and description: Tail section of body not attenuate; **scales absent from head and reduced or absent on body**; eye size variable but small 6.8 to 14 in head length; maxilla vertically expanded posteriorly; opercular spine present; palatine teeth present; branchiostegal rays 7 to 9; developed rakers on first gill arch 0 to 6; **males with a stalked intromittent organ; anal fin originating on posterior half of body; pectoral fins supported by elongated radials** (inclosed in a free peduncle in some, adnate in others); pectoral-fin rays 12 to 23; pelvic fins with 1 ray in each; precaudal vertebrae 12 to 20.

Revisions: Cohen and Nielsen (1972), Cohen (1987).

Geographical distribution: Indian Ocean off East Africa, off New South Wales, Australia, South China Sea, Hawaii, northern Peru, and western Atlantic from Florida, Gulf of Mexico, and off Brazil. Unknown so far from the eastern Atlantic.

Habitat and biology: Apparently benthic or benthopelagic on soft bottom at depths of 100 to 834 m, although, 1 species, *Saccogaster melanomycter*, was caught at 7.5 m in a coral reef habitat.

Interest to fisheries: None.

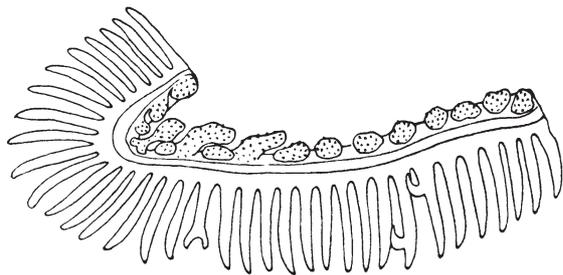
Size: The largest known specimen, a male *S. tuberculata*, is 160 mm, but most specimens of most species are less than 100 mm. A 134 mm female specimen of *S. tuberculata* contains eyed embryos and the 58 mm holotype of *S. parva* contains developing eggs.

Key to species

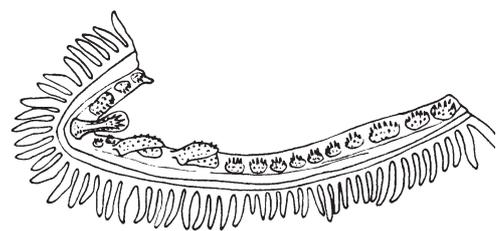
- 1a. Scales present on body → 2
- 1b. Scales absent from body → 4

- 2a. Spine on opercle with 3 points; pectoral-fin rays 22; dorsal-fin rays 92 *S. hawaii*
- 2b. Spine on opercle with a single point; pectoral-fin rays 16 to 18; dorsal-fin rays 75 to 88 → 3

- 3a. Gill filaments on first arch not notably reduced in size (Fig. 108a); palatine tooth row several teeth wide; dorsal-fin rays 75 to 83 *S. maculata*
- 3b. Gill filaments on first arch notably reduced in size (Fig. 108b); palatine teeth in a single row; dorsal-fin rays 87 or 88 *S. staigeri*



a) *Saccogaster maculata*



b) *Saccogaster staigeri*

Fig. 108 First gill arch (from Cohen and Nielsen, 1972)

- 4a. Antorse hook-like projection at posteroventral angle of maxilla; pectoral-fin rays 12; branchiostegal rays 7 *S. rhamphidognatha*
- 4b. No hook-like projection at posteroventral angle of maxilla; pectoral-fin rays 14 to 23; branchiostegal rays 8 or 9 → 5

- 5a.** Pectoral fins borne on a free fleshy peduncle; gill opening extending above level of top pectoral-fin ray → **6**
- 5b.** Pectoral fins without a free fleshy peduncle; gill opening restricted, not extending above level of top pectoral-fin ray → **7**
- 6a.** Pectoral-fin rays 20 to 23; anal-fin rays 56 to 61; developed rakers on first arch 3 *S. tuberculata*
- 6b.** Pectoral-fin rays 14; anal-fin rays 64; developed rakers on first arch 6 *S. parva*
- 7a.** Posterior end of maxilla sheathed dorsally; anal-fin rays 53 or 54; nasal chambers not sooty black *S. normae*
- 7b.** Posterior end of maxilla not sheathed dorsally; anal-fin rays 37; nasal chambers sooty black *S. melanomycter*

List of species

Saccogaster hawaii Cohen and Nielsen, 1972. Off Maui, Hawaii. Known from a single specimen caught by a bottom trawl at 234 m. Rare.

S. maculata Alcock, 1889. Tropical Indian Ocean; caught with bottom trawls fishing at 265 to 600 m. Rare.

S. melanomycter Cohen, 1987. Caribbean Sea near Santa Marta, Colombia. Known from a single specimen caught in a coral reef environment at 7.6 m. Rare.

S. normae Cohen and Nielsen, 1972. Off the southern end of Peru. Known from 2 specimens caught by bottom trawls at 118 to 133 m and 150 m. Rare.

S. parva Cohen and Nielsen, 1972. Off the coast of Brazil south of Rio de Janeiro (corrected type locality: 24°1'S, 43°54'W). Known from a single specimen caught by a bottom trawl fishing at 500 m (corrected depth). Rare.

S. rhamphidognatha Cohen, 1987. Northern Gulf of Mexico off the Mississippi delta. Known from a single specimen caught at 210 m. Rare.

S. staigeri Cohen and Nielsen, 1972. East coast of Florida and Gulf of Mexico. Caught with bottom trawls fishing at 200 to 350 m. Rare.

S. tuberculata (Chan, 1966). South China Sea, east and west coasts of Australia and Hawaii. Caught at 585 to 834 m. Rare.

<i>Stygnobrotula</i> Böhlke, 1957

Type species: *Stygnobrotula latebricola* Böhlke, 1957 by original designation.

Synonyms: None.

Number of recognized species: 1.

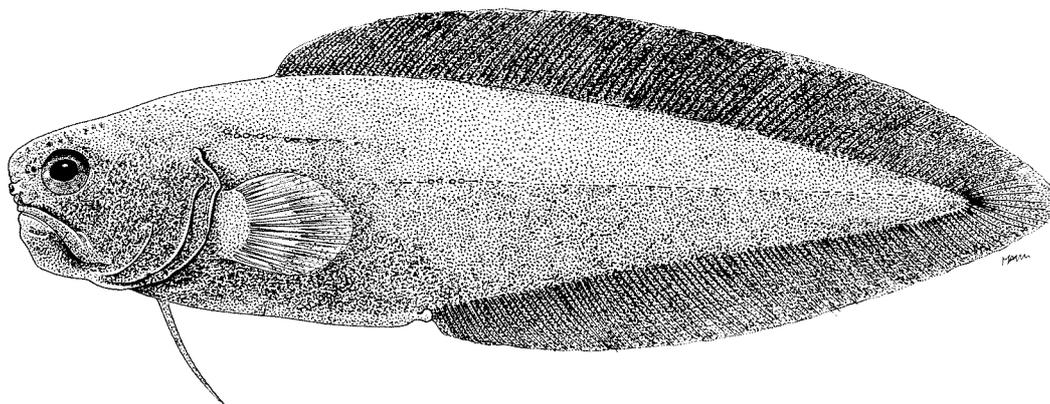


Fig. 109 *Stygnobrotula latebricola* (after Böhlke, 1957)

Diagnosis and description: Head and body notably compressed; snout blunt; maxilla narrow posteriorly; scales present on head; snout equals diameter of eye; upper jaw ends just behind eye; no opercular spine; some jaw teeth enlarged, palatines edentate; developed rakers on anterior gill arch 3 or 4; pectoral-fin rays 21 to 23; pelvic fins with 1 ray in each; precaudal vertebrae 14 with pointed neural spines.

Revisions: None.

Geographical distribution: Tropical western North Atlantic from the Bahamas to Curaçao.

Habitat and biology: Reef-dwelling.

Interest to fisheries: None.

Size: At least 70 mm.

List of nominal species

Stygnobrotula latebricola Böhlke, 1957. Information see above. Common.

Eutyx tumidirostris Boesemann, 1960 (junior synonym of *S. latebricola*).

Thalassobathia Cohen, 1963

Type species: *Thalassobathia pelagica* Cohen, 1963 by original designation.

Synonyms: None.

Number of recognized species: 2.

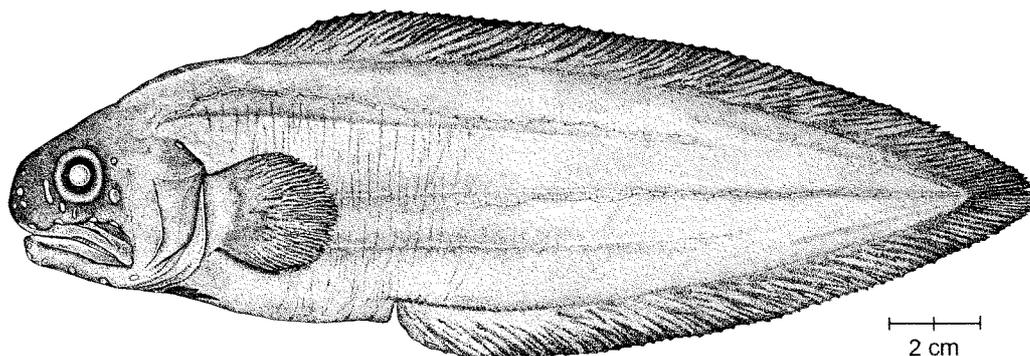


Fig. 110 *Thalassobathia pelagica* (from Cohen, 1963)