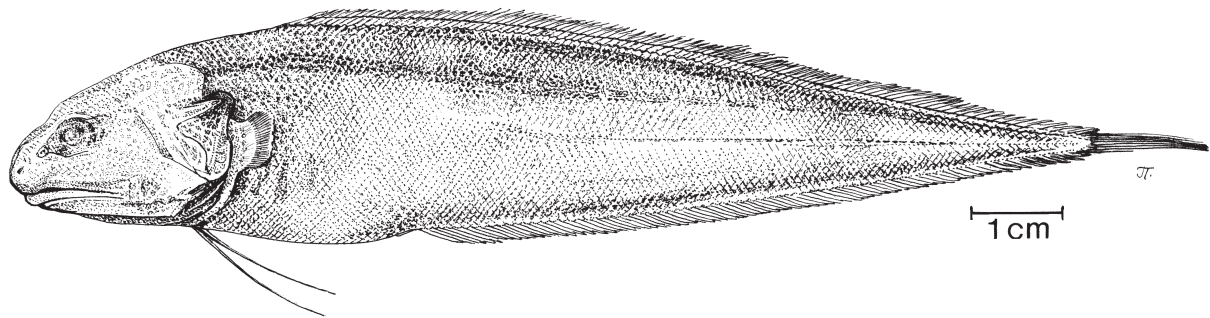


***Monomitopus* Alcock, 1890b**

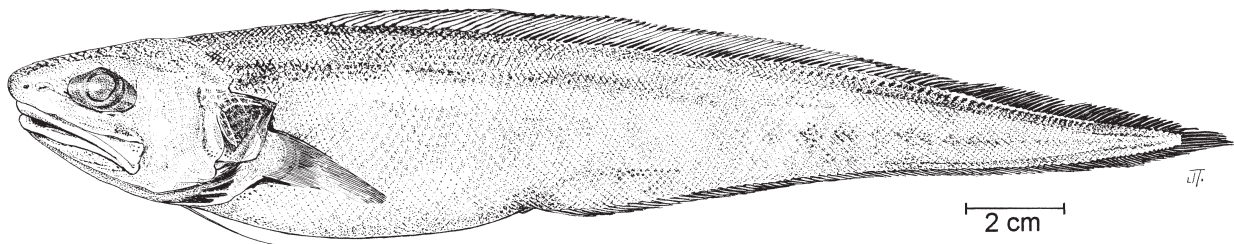
**Type species:** *Sirembo nigripinnis* Alcock, 1889 by monotypy.

**Synonyms:** *Dicromita* Goode and Bean, 1896, type species *Dicromita agassizi* Goode and Bean; *Monomeropus* Garman, 1899, type species *Monomeropus malispinosus* Garman.

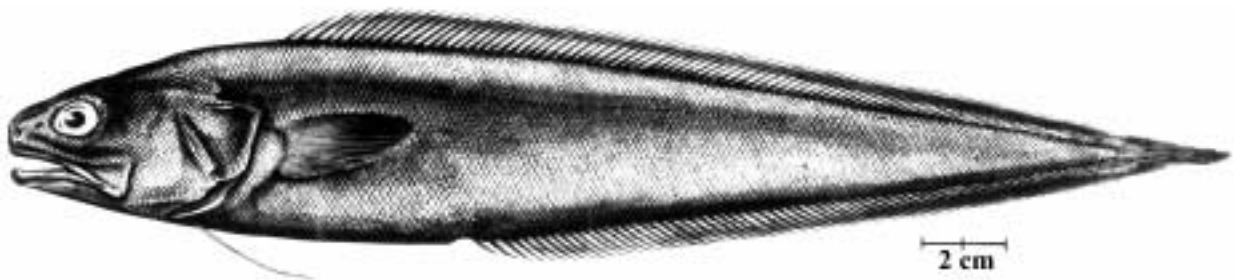
**Number of recognized species:** 14.



**Fig. 75** *Monomitopus vityazi* (*M. nigripinnis* species group) (from Nielsen, 1971)



**Fig. 76** *Monomitopus americanus* (*M. pallidus* species group) (from Nielsen, 1971)



**Fig. 77** *Monomitopus microlepis* (*M. torvus* species group) (from Smith and Radcliffe in Radcliffe, 1913)

**Diagnosis and description:** Robust body; eye diameter equal to or slightly shorter than snout; opercular spine strong; preopercle with 2 or 3 more or less distinct spines at lower angle; 1 median basibranchial tooth patch, 10 to 27 developed rakers on anterior gill arch; pectoral-fin rays 26 to 34; pelvic-fin rays 1; precaudal vertebrae 13 to 15.

**Revisions:** Carter and Cohen (1985) suggested 3 species groups.

**Geographical distribution:** Below tropical and subtropical areas of all oceans.

**Habitat and biology:** Benthopelagic at upper continental slope and bathyal depths (150 to 1 570 m).

**Interest to fisheries:** None.

**Size:** At least 535 mm.

**Remarks:** This genus is much in need of a revision. Large, unstudied collections are kept in many museums. According to Carter and Cohen (1985) there are several undescribed species.

**Key to species** (based on literature and material at the U.S. National Museum)

- 1a.** Developed gill rakers on lower arm of anterior arch 7 to 10 (including angle) . . . . . → **2**  
**1b.** Developed gill rakers on lower arm of anterior arch 12 to 19 (including angle) . . . . . → **4**
- 2a.** Horizontal diameter of eye 3.7 in head length . . . . . *M. pallidus*  
**2b.** Horizontal diameter of eye 4.9 to 5.6 in head length . . . . . → **3**
- 3a.** Dorsal-fin rays 104 to 108; anal-fin rays 85 to 92; total vertebrae 61 to 65 . . . . . *M. magnus*  
**3b.** Dorsal-fin rays 99; anal-fin rays 82; total vertebrae 59 . . . . . *M. microlepis*
- 4a.** Oblique scale rows between origin of dorsal fin and lateral line 12 to 19 . . . . . → **5**  
**4b.** Oblique scale rows between origin of dorsal fin and lateral line 7 to 10 . . . . . → **8**
- 5a.** Horizontal diameter of eye 3.8 to 4.7 in head length . . . . . → **6**  
**5b.** Horizontal diameter of eye 5.7 to 6.0 in head length . . . . . → **7**
- 6a.** Horizontal diameter of eye 3.8 in head length; dorsal-fin rays 100 to 108; anal-fin rays 95 . . . . . *M. americanus*  
**6b.** Horizontal diameter of eye 4.3 to 4.7 in head length; dorsal-fin rays 95; anal-fin rays 78 . . . . . *M. conjugator*
- 7a.** Dorsal-fin rays 100; anal-fin rays 83 . . . . . *M. kumae*  
**7b.** Dorsal-fin rays 109; anal-fin rays 78 . . . . . *M. torvus*
- 8a.** Head length 3.8 in standard length . . . . . *M. longiceps*  
**8b.** Head length 4.2 to 5.0 in standard length . . . . . → **9**
- 9a.** Dorsal fin with 93 rays; total vertebrae 55 . . . . . *M. vityazi*  
**9b.** Dorsal fin with 95 to 104 rays; total vertebrae 58 to 62 . . . . . → **10**
- 10a.** Dorsal-fin rays 104; anal-fin rays 88; total vertebrae 62. . . . . *M. agassizi*  
**10b.** Dorsal-fin rays 95 to 102; anal-fin rays 78 to 85; total vertebrae 58 or 59 . . . . . → **11**
- 11a.** Posteroventral margin of preopercle with 2 or 3 broad, strong points . . . . . → **12**  
**11b.** Posteroventral margin of preopercle rounded or with weak flaps, no sharp points . . . → **14**
- 12a.** Head length 4.2 to 4.3 in standard length . . . . . *M. conjugator*  
**12b.** Head length 4.5 to 5.0 in standard length. . . . . → **13**

- 13a.** Horizontal diameter of eye 4.1 to 4.2 in head length (Atlantic) . . . . . *M. metriostoma*  
**13b.** Horizontal diameter of eye 4.2 to 5.3 in head length (Pacific) . . . . . *M. malispinosus*
- 14a.** Horizontal diameter of eye 3.9 to 4.7 in head length . . . . . *M. nigripinnis*  
**14b.** Horizontal diameter of eye 5.0 in head length . . . . . *M. garmani*

### List of species

Carter and Cohen (1985) proposed the following 3 species groups:

#### Species group 1

*Monomitopus nigripinnis* species group (head relatively deep and downward inflected, poorly ossified opercular bones, flaps rather than spines on hind margin of preopercle).

*M. agassizi* (Goode and Bean, 1896). West Atlantic at 530 to 1 010 m. Common.

*M. conjugator* (Alcock, 1896). Bay of Bengal at 540 to 760 m. Common.

*M. garmani* Smith and Radcliffe in Radcliffe, 1913. From Celebes to New Caledonia at 825 to 1 220 m. Common.

*M. malispinosus* (Garman, 1899). Eastern Pacific at 1865 m. Rare.

*M. metriostoma* (Vaillant, 1888). Off West Africa from 40°N to 10°S at 235 to 1 570 m. Common.

*M. nigripinnis* (Alcock, 1889). From off East Africa to the Andaman Sea at 700 to 1 510 m. Common.

*M. vityazi* (Nielsen, 1971). Off Western Australia at 835 m. Rare.

#### Species group 2

*M. pallidus* species group (head relatively slender with an almost straight dorsal profile, well ossified opercular bones, strong spines on hind margin of preopercle):

*M. americanus* (Nielsen, 1971). Southwestern Atlantic at 600 to 800 m. Uncommon.

*M. magnus* Carter and Cohen, 1985. Off southeastern North America at 730 to 930 m. Uncommon.

*M. pallidus* Smith and Radcliffe in Radcliffe, 1913. From off the Philippines and East China Sea at 200 to 600 m. Common.

#### Species group 3

*M. torvus* species group (relatively straight dorsal profile, intermediate development of head spines compared to the other 2 species groups):

*M. kumae* Jordan and Hubbs, 1925. From off southern Japan to East China Sea at 600 to 800 m. Common.

*M. longiceps* Smith and Radcliffe in Radcliffe, 1913. From off Indonesia and the Philippines at 150 to 960 m. Common.

*M. microlepis* Smith and Radcliffe in Radcliffe, 1913. Off the Philippines at 705 m. Rare.

*M. torvus* Garman, 1899. Eastern Pacific at 820 to 1 015 m. Rare.

*Neobythites* Goode and Bean, 1885

**Type species:** *Neobythites gilli* Goode and Bean, 1885 by monotypy.

**Synonyms:** *Tetranematopus* Günther, 1887 (nomem nudum); *Watasea* Jordan and Snyder, 1901, type species *Watasea sivicola* Jordan and Snyder.

**Number of recognized species:** 35.

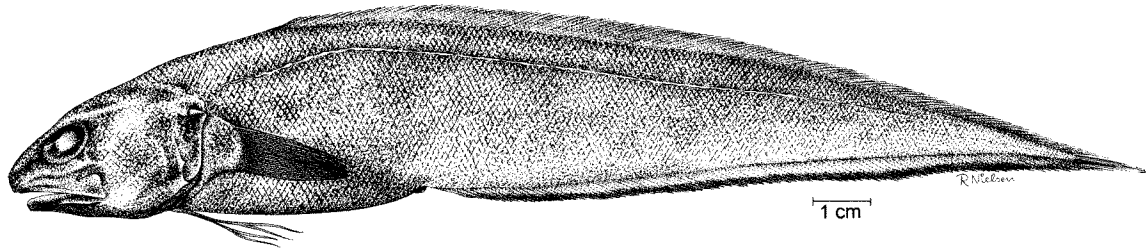


Fig. 78 *Neobythites analis* (from Nielsen, 1995)

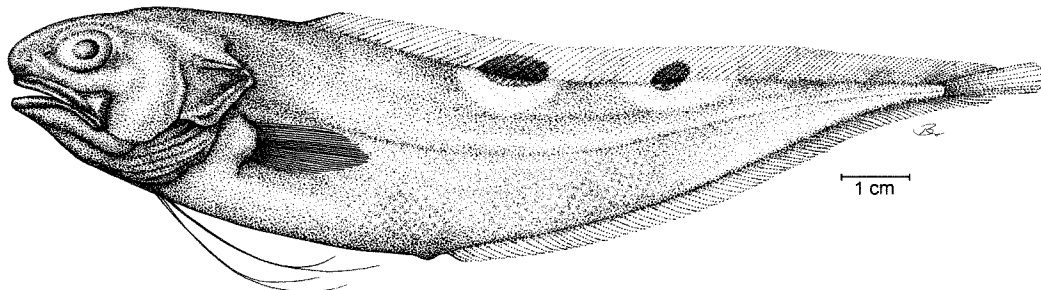


Fig. 79 *Neobythites gilli* (from Nielsen, 1999)

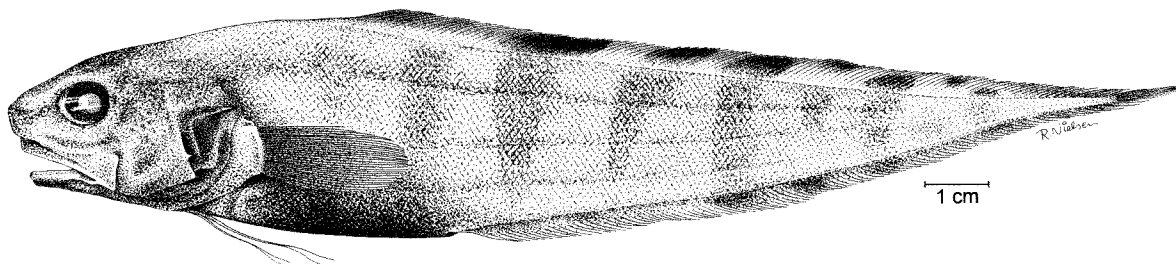


Fig. 80 *Neobythites multistriatus* (from Nielsen and Quero, 1991)

**Diagnosis and description:** Snout most often blunt, rarely pointed; mouth terminal or subterminal; horizontal diameter of eye window equal to or slightly shorter than snout; opercular spine strong and straight, hind margin of preopercle with 0 to 2 (rarely 3) spines; median basibranchial tooth patches 2, pseudobranchial filaments 1 to 8; developed rakers on anterior gill arch 6 to 34; pectoral-fin rays 22 to 34; large variation in colour patterns with some species unmarked, some with 1 to many ocelli on dorsal and anal fins and/or horizontal or vertical, dark bands on body and fins; pelvic-fin rays 2 in each fin; precaudal vertebrae 11 to 14.

**Revisions:** No revision includes all *Neobythites* spp. but the species from the following geographical areas have been revised: western Indian Ocean (Nielsen, 1995), New Caledonia (Nielsen, 1997) and western Atlantic (Nielsen, 1999).

**Geographical distribution:** Below tropical and subtropical areas of all oceans except for the eastern Atlantic.



**Habitat and biology:** Benthopelagic at lower continental shelf and at bathyal depths ((25?) 100 to 1 830 m).

**Interest to fisheries:** A few species known from fish markets in Japan.

**Size:** At least 350 mm.

**Remarks:** When the species from the eastern Indian and the western Pacific Ocean have been revised (Nielsen in prep.) at least 10 additional species can be expected.

### Keys to species

#### A. West Atlantic Ocean (from Nielsen, 1999)

- 1a. Preopercular spines 0 or 1 . . . . . → 2
- 1b. Preopercular spines 2 . . . . . → 5
- 2a. No ocelli in dorsal fin; preopercular spine strong . . . . . *N. unicolor*
- 2b. Dorsal fin with 1 to 6 ocelli; preopercular spine absent or broad and thin . . . . . → 3
- 3a. Dorsal fin with 1 ocellus . . . . . *N. monocellatus*
- 3b. Dorsal fin with 2 to 6 ocelli . . . . . → 4
- 4a. Dorsal fin with 2 (rarely 3 or 4) ocelli; body and jaws dark brown . . . . . *N. gilli*
- 4b. Dorsal fin with 4 (rarely 5 to 8) ocelli; body and jaws light brown . . . . . *N. ocellatus*
- 5a. Dorsal fin without markings. . . . . → 6
- 5b. Dorsal fin with black markings or horizontal stripes . . . . . → 7
- 6a. Two broad spines on preopercle; pectoral-fin rays 32 . . . . . *N. multidigitatus*
- 6b. Two strong, pointed spines on preopercle; pectoral-fin rays 23 to 26 . . . . . *N. elongatus*
- 7a. Dorsal fin and body with horizontal, dark band . . . . . *N. marginatus*
- 7b. Body with 5 to 7 diffuse, dark brown, vertical bands ending in black spots on dorsal and anal fins . . . . . *N. braziliensis*

#### B. Western Indian Ocean (from Nielsen, 1995)

- 1a. Preopercular spines 0 or 1 (weak) . . . . . → 2
- 1b. Preopercular spines 2 (rarely 1 or 3) . . . . . → 6
- 2a. Dorsal fin with 2 ocelli . . . . . *N. kenyaensis*
- 2b. Dorsal fin with 1 ocellus . . . . . → 3
- 3a. Vertical bar below ocellus; origin of dorsal fin above opercle . . . . . *N. malhaensis*
- 3b. No vertical bar; origin of dorsal fin above pectoral fins. . . . . → 4
- 4a. Dorsal-fin ocellus above anus; long gill rakers 6. . . . . *N. meteori*
- 4b. Dorsal-fin ocellus above anterior part of anal fin; long gill rakers 10 to 14. . . . . → 5

- 5a. Edge of anal fin transparent; body with 4 ill-defined, brown, vertical bars; longest gill filaments 15 to 19% head length . . . . . *N. steatiticus*
- 5b. Edge of anal fin black; no dark, vertical bars; longest gill filaments 9 to 16% head length. . . . . *N. stefanovi*
- 6a. Teeth needle-like; black area behind eyes. . . . . *N. trifilis*
- 6b. Teeth granular; no black area behind eyes . . . . . → 7
- 7a. Dorsal fin with ocelli or large, dark blotches . . . . . → 8
- 7b. Dorsal fin without ocelli or large, dark blotches . . . . . → 10
- 8a. Dorsal fin with 7 or 8 and anal fin with 3 or 4 dark blotches; 4 to 10 dark, vertical bars on body; developed gill rakers 12 to 15 . . . . . *N. multistriatus*
- 8b. Dorsal fin with 2 distinct or about 6 indistinct ocelli; no bars on body; long gill rakers 8 to 10 . . . . . → 9
- 9a. Dorsal fin with 2 distinct ocelli . . . . . *N. crosnieri*
- 9b. Dorsal fin with about 6 indistinct ocelli . . . . . *N. natalensis*
- 10a. Distal part of dorsal and anal fins black; longest gill filaments 10.5 to 14% head length . . . . . *N. somaliaensis*
- 10b. Distal part of dorsal fin not black, anal fin black or not; longest gill filaments 4.4 to 7.7% head length . . . . . → 11
- 11a. Distal part of anal fin black; posterior margin of vomer tooth patch concave or straight. . . . . *N. analis*
- 11b. Anal fin not black; posterior margin of vomer tooth patch convex . . . . . *N. vityazi*
- C. New Caledonian waters** (from Nielsen, 1997)
- 1a. Pelvic-fin rays reaching beyond anus; dorsal part of body mottled; 2 ocelli in dorsal fin with the anterior placed at origin of fin . . . . . *N. longiventralis*
- 1b. Pelvic-fin rays not reaching anus; body not mottled; 0 to 2 ocelli in dorsal fin with the anterior placed posterior to anus . . . . . → 2
- 2a. No spines on hind margin of preopercle; pectoral-fin rays 33 to 34; 7 or 8 developed gill rakers . . . . . *N. bimarginatus*
- 2b. Two spines on hind margin of preopercle; pectoral-fin rays 25 to 29; 10 to 16 developed gill rakers . . . . . → 3
- 3a. Dorsal fin with about 4 dark blotches or ocelli continuing on body as dark, vertical bars . . . . . *N. zonatus*
- 3b. No dark, vertical bars on body . . . . . → 4
- 4a. One or 2 ocelli on dorsal fin . . . . . → 5
- 4b. No ocelli on dorsal fin. . . . . → 6
- 5a. One ocellus on dorsal fin . . . . . *N. unimaculatus*
- 5b. Two ocelli on dorsal fin . . . . . *N. bimaculatus*

- 6a.** Developed rakers on anterior gill arch 14 to 16; longest gill filaments on anterior arch 2.8 to 4.8% head length . . . . . *N. pallidus*
- 6b.** Developed rakers on anterior gill arch 11; longest gill filaments on anterior arch 6.1 to 7.6% head length . . . . . *N. neocaledoniensis*

### List of nominal species

*Neobythites analis* Barnard, 1927. From Mozambique to off Cape Town at 100 to 365 m in the Indian Ocean and at 1 830 m in the Atlantic. Common.

*N. bimaculatus* Nielsen, 1997. Off New Caledonia at 435 to 480 m. Rare.

*N. bimarginatus* Fourmanoir and Rivaton, 1979. Off New Caledonia and nearby islands at 295 to 530 m. Common.

*N. braziliensis* Nielsen, 1999. Off northern Brazil at 320 to 410 m. Common.

*N. crosnieri* Nielsen, 1995. Off western Madagascar at 125 to 350 m. Rare.

*N. elongatus* Nielsen and Retzer, 1994. Caribbean Sea at 230 to 1 270 m. Common.

*N. fasciatus* Smith and Radcliffe *in* Radcliffe, 1913. The Philippines at 220 to 460 m. Uncommon.

*N. gilli* Goode and Bean, 1885. Gulf of Mexico at 60 to 230 m. Common.

*N. kenyaensis* Nielsen, 1995. Off Kenya and Tanzania at 240 to 300 m. Rare.

*N. longipes* Smith and Radcliffe *in* Radcliffe, 1913. From the Philippines to off Northwest Australia at 300 to 480 m. Uncommon.

*N. longiventralis* Nielsen, 1997. From the Philippines to New Caledonia at 205 to 330 m. Rare.

*N. macrops* Günther, 1887. From Bay of Bengal to the Philippines and Northwest Australia at 350 to 505 m. Common.

*N. malayanus* Weber, 1913. From the Philippines to Indonesia and Vanuatu at 124 to 550 m. Common.

*N. malhaensis* Nielsen, 1995. Saya de Malha Bank north of Mauritius at 235 to 250 m. Rare.

*N. marginatus* Goode and Bean, 1886. From off North Carolina to northern South America including the Gulf of Mexico at 75 to 935 m. Common.

*N. meteori* Nielsen, 1995. Off Socotra Island at 175 to 335 m. Rare.

*N. monocellatus* Nielsen, 1999. Off northern South America at 115 to 440 m. Common.

*N. multidigitatus* Nielsen, 1999. Off the Bahamas. Rare.

*N. multistriatus* Nielsen and Quero, 1991. Off Reunion and Rodrigues at 300 to 490 m. Rare.

*N. natalensis* Nielsen, 1995. Off Natal and western Madagascar at 310 to 590 m. Rare.

*N. neocaledoniensis* Nielsen, 1997. Off New Caledonia and on Norfolk Ridge at 470 to 670 m. Rare.

*N. nigromaculatus* Kamohara, 1938 (junior synonym of *N. unimaculatus*).

*N. ocellatus* Günther, 1887. From Strait of Florida to off Recife, Brazil (excluding the Gulf of Mexico) at 45 to 640 m. Common.

*N. pallidus* Nielsen, 1997. Off New Caledonia at 500 to 620 m. Uncommon.

*N. purus* Smith and Radcliffe *in* Radcliffe, 1913. From the Philippines to Indonesia at 175 to 700 m. Common.

*N. sivicola* (Jordan and Snyder, 1901). From Japan to Taiwan Province of China at 75 to 100 m. Common. Marketed.

*N. somaliaensis* Nielsen, 1995. Gulf of Aden at 300 to 490 m. Uncommon.

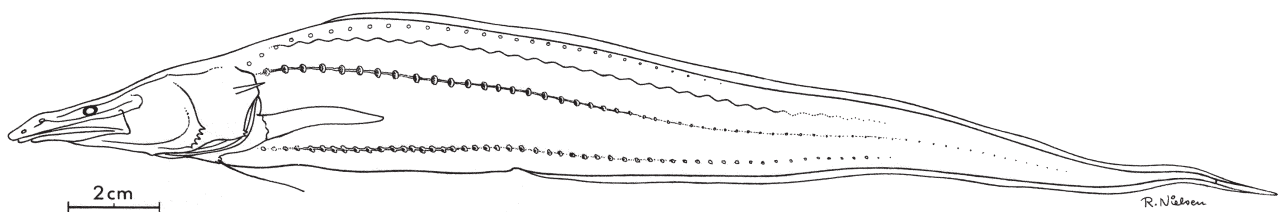
- N. steatiticus* Alcock, 1893. From Bay of Bengal to Arabian Gulf at 195 to 460 m. Rare.
- N. stefanovi* Nielsen and Uiblein, 1993. From the Red Sea to the Gulf of Oman at 435 to 805 m. Uncommon.
- N. stelliferoides* Gilbert, 1890. From the northern part of the Gulf of California to off northern Peru at 90 to 310 m. Common.
- N. stigmatosus* Machida, 1984. From Japan to Taiwan Province of China at 160 to 300 m. Common. Marketed.
- N. trifilis* Kotthaus, 1979. From Socotra Island to Andaman Sea at 175 to 420 m. Common.
- N. unicolor* Nielsen and Retzer, 1994. Caribbean Sea at 185 to 935 m. Common.
- N. unimaculatus* Smith and Radcliffe in Radcliffe, 1913. Off Japan, the Philippines and New Caledonia at 110 to 565 m. Uncommon.
- N. vityazi* Nielsen, 1995. Mozambique Channel at 280 to 760 m. Uncommon.
- N. zonatus* Nielsen, 1997. From Caroline Islands to New Caledonia and a few nearby islands at 275 to 950 m. Uncommon.

*Penopus* Goode and Bean, 1896

**Type species:** *Penopus macdonaldi* Goode and Bean, 1896 by monotypy.

**Synonyms:** None.

**Number of recognized species:** 1.



**Fig. 81** *Penopus microcephalus*

**Diagnosis and description:** Head depressed anteriorly; snout long and projecting over mouth, body long and slender; depth at anus about 10 times in standard length; eyes very small, preopercle with 4 or 5 spines at lower angle, opercle with 1 strong, curved spine, median basibranchial tooth patches 2 and rarely with an additional pair; 8 to 10 developed rakers on anterior gill arch; 3 lateral lines with circular organs; pectoral-fin rays 17 to 19; pelvic-fin rays 2 in each; precaudal vertebrae 18 or 19.

**Revisions:** Séret (1988).

**Geographical distribution:** Tropical Atlantic Ocean and off Cape Town.

**Habitat and biology:** Benthopelagic at bathyal depths (1 320 to 3 535 m).

**Interest to fisheries:** None.

**Size:** At least 315 mm.



### List of nominal species

*Penopus macdonaldi* Goode and Bean, 1896 (junior synonym of *P. microcephalus*).

*P. microcephalus* (Vaillant, 1888). Information see above. Rare.

*Petrotyx* Heller and Snodgrass, 1903

**Type species:** *Petrotyx hopkinsi* Heller and Snodgrass, 1903 by monotypy.

**Synonyms:** *Pseudobythites* Meek and Hildebrand, 1928. Type species *Pseudobythites sanguineus* Meek and Hildebrand.

**Number of recognized species:** 2.

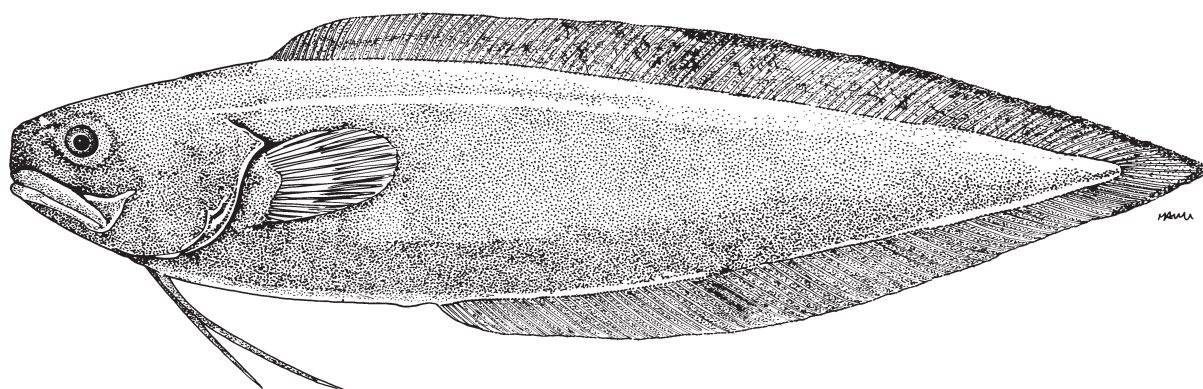


Fig. 82 *Petrotyx sanguineus* (after Böhlke and Chaplin, 1968)

**Diagnosis and description:** Snout with numerous small, fleshy papillae, lips bearing series of dermal fringes; eye small; posterior margin of preopercle skin-covered; spines absent from opercle and preopercle; upper margin of maxilla sheathed; developed gill rakers 3; single lateral line on body, apparently no pores on head; median basibranchial tooth patch 1; branchiostegal rays 8; pelvic fins with 2 rays in each; precaudal vertebrae 12.

**Revisions:** Böhlke (1955).

**Geographical distribution:** Tropical American reefs.

**Habitat and biology:** Taken at depths from 4 to 21 m on reefs; apparently secretive in habit.

**Interest to fisheries:** None.

**Size:** At least 200 mm.

### Key to species

- 1a. Length of head 4.0 to 4.6 and length of pelvic fin 5.0 to 5.5 in total length . . . *P. sanguineus*  
 1b. Length of head 4.9 to 5.9 and length of pelvic fin 6.1 to 7.1 in total length . . . . *P. hopkinsi*

**List of species**

*Petrotyx hopkinsi* Heller and Snodgrass, 1903. Tropical eastern Pacific including Galapagos Islands. Lives in rocky crevices on reef. Uncommon.

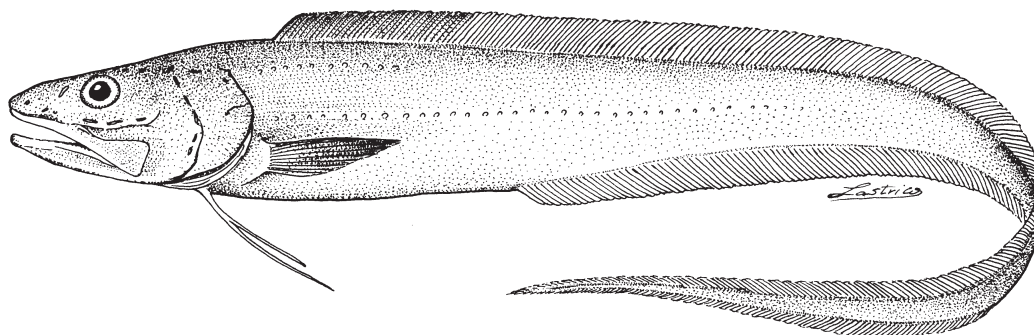
*P. sanguineus* (Meek and Hildebrand, 1928). Tropical western Atlantic from Florida Keys and Bahamas to northern South America. In the Bahamas on patch reefs at 3 to 15 m. Common.

***Porogadus*** Goode and Bean, 1885

**Type species:** *Porogadus miles* Goode and Bean, 1885 by monotypy.

**Synonyms:** *Dermatorus* Alcock, 1890b, type species *Dermatorus trichiurus* Alcock; *Celema* Goode and Bean, 1896, type species *Porogadus nudus* Vaillant, 1888; *Moebia* Goode and Bean, 1896, type species *Bathynectes gracilis* Günther, 1887.

**Number of recognized species:** 13.



**Fig. 83** *Porogadus miles* (after Goode and Bean, 1896)

**Diagnosis and description:** Body long and slender; depth at anus more than 10 times in standard length; prominent mucous cavities beneath orbital region and on posterior margin of preopercle, upper jaw ends well behind eye; spines on head variously developed in different species; opercular spine flat and weak, 0 to 2 small median basibranchial tooth patches; developed rakers on anterior gill arch 12 to 22; lateral line represented by 3 rows of circular organs variously developed from one species to another and by a row of easily shed modified scales, pectoral-fin rays 14 to 20; pelvic-fin rays 1(?) to 2; precaudal vertebrae 15 to 18.

**Revisions:** Nybelin (1957) divided the genus into 3 species groups according to the development of the head spines (see list of nominal species below). Carter and Sulak (1984) reviewed the western Atlantic species.

**Geographical distribution:** Below tropical and subtropical areas of all oceans.

**Habitat and biology:** Benthopelagic at bathyal and abyssal depths (805 to 5 300 m).

**Interest to fisheries:** None.

**Size:** At least 390 mm.

**Remarks:** A general revision of *Porogadus* is much needed. Available material is present in many collections.

**Key to species** (only available for West Atlantic species; from Carter and Sulak, 1984)

- 1a.** Head depth 60 to 75% of head length; frontal spine above eye absent; margins of preopercle smooth; lateral-line scales to level of anus 14 to 20 . . . . . *P. silus*
- 1b.** Head depth less than 60% of head length; frontal spine above eye present; margins of preopercle with scalloped edges or spines; lateral-line scales to level of anus 20 or more . . . . . → 2
- 2a.** Spines on top and sides of head well developed; lateral-line scales to level of anus 40 or more; 3 prominent lateral lines . . . . . *P. miles*
- 2b.** Spines on top and sides of head poorly developed; lateral-line scales to level of anus 28 to 36; lateral line absent . . . . . *P. catena*

**List of nominal species****Species group 1** (with strong head spines)

*Porogadus miles* Goode and Bean, 1886. Cosmopolitan at 1 000 to 5 055 m. Common.

*P. melanocephalus* (Alcock, 1891). Bay of Bengal at 3 010 to 3 200 m. Rare.

*P. nudus* Vaillant, 1888. East Atlantic at 2 325 to 3 200 m. Rare.

*P. trichiurus* (Alcock, 1890b). Western Indian Ocean at 1 335 to 2 310 m. Uncommon.

**Species group 2** (with moderate head spines)

*P. guentheri* Jordan and Fowler, 1902. Off Japan at 805 to 1 530 m. Uncommon.

*P. melampeplus* (Alcock, 1896). Western Indian Ocean at 1 500 to 2 000 m. Uncommon.

*P. subarmatus* Vaillant, 1888. Eastern Atlantic at 3 200 m. Rare.

**Species group 3** (with very weak head spines)

*P. abyssalis* Nybelin, 1957. Central Atlantic at 5 250 to 5 300 m. Rare.

*P. atripectus* Garman, 1899. Gulf of Panama at 1 950 to 3 220 m. Rare.

*P. breviceps* Garman, 1899 (junior synonym of *P. catena*).

*P. catena* (Goode and Bean, 1886). Western Atlantic and Gulf of Panama at 1 180 to 3 500 m. Uncommon.

*P. gracilis* (Günther, 1878). Western Pacific at 2 560 m. Rare.

*P. longiceps* Garman, 1899. Eastern Pacific at 1 865 to 3 280 m. Rare.

*P. promelas* Gilbert, 1891 (junior synonym of *P. catena*).

*P. silus* Carter and Sulak, 1984. Off the Bahamas and in the Caribbean Sea at 1 500 to 3 510 m. Uncommon.

<i>Pycnocraspedum</i> Alcock, 1889
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**Type species:** *Pycnocraspedum squamipinne* Alcock, 1889 by monotypy.

**Synonyms:** *Itatius* Matsubara, 1943, type species *Itatius microlepis* Matsubara.

Number of recognized species: 5.

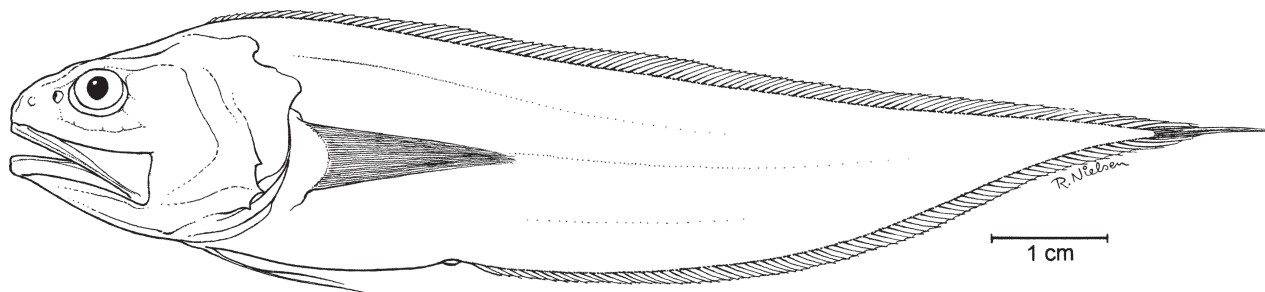


Fig. 84 *Pycnocraspedum squamipinne* (from Nielsen, 1997)

**Diagnosis and description:** Body short with large head; upper jaw ends behind eye; opercular spine strong but not always visible; hind margin of preopercle with 2 to 4 spines; eye equal to or slightly shorter than snout; 2 median basibranchial tooth patches and in *P. fulvum* additionally a pair of small patches; 4 to 6 developed rakers on anterior gill arch, pectoral-fin rays 24 to 28; pelvic-fin rays 2; precaudal vertebrae 12 or 13.

**Revisions:** Revisionary notes in Machida (1984) and remarks in Nielsen (1997).

**Geographical distribution:** From off East Africa to Hawaii and in the western Atlantic.

**Habitat and biology:** Benthopelagic at bathyal depths (145 to 500 m). The 100 mm deep-bodied, juvenile holotype and only known specimen of *Pycnocraspedum phyllosoma* was caught pelagically indicating the possibility of a wide species distribution.

**Interest to fisheries:** None.

**Size:** At least 340 mm.

**Remarks:** A full revision is needed.

**Key to species:** Not possible at present.

#### List of species

*Pycnocraspedum armatum* Gosline, 1954. Off Hawaii, no depth as killed by lava flow. Rare.

*P. fulvum* Machida, 1984. Okinawa Trough at 143 m. Rare.

*P. microlepis* (Matsubara, 1943). From off Japan to East China Sea at 300 to 500 m. Uncommon.

*P. phyllosoma* (Parr, 1933). Off the Bahamas, caught pelagically. Rare.

*P. squamipinne* Alcock, 1889. From East Africa to New Caledonia at 200 to 500 m. Uncommon.