

## Deepwater Ophidiiform fishes from off New Caledonia with six new species

*Jørgen G. NIELSEN*

Zoological Museum  
University of Copenhagen  
Universitetsparken 15  
DK 2100 Copenhagen  
Denmark

### ABSTRACT

During the ORSTOM explorations (1985-92) off New Caledonia 149 specimens of the order Ophidiiformes were caught. They represent 24 species of which the following are new: *Neobythites bimaculatus*, *N. longiventralis*, *N. neocaledoniensis*, *N. pallidus*, *N. zonatus* and *Parasciadonus pauciradiatus*. All 24 species are illustrated and a key is provided.

### RÉSUMÉ

#### **Poissons Ophidiiformes des eaux profondes de Nouvelle-Calédonie, avec la description de six espèces nouvelles.**

Au cours des campagnes de prospection effectuées par l'ORSTOM en Nouvelle-Calédonie, 149 spécimens de brotules (Ophidiiformes) ont été récoltés. Ils représentent 24 espèces dont six sont nouvelles : *Neobythites bimaculatus*, *N. longiventralis*, *N. neocaledoniensis*, *N. pallidus*, *N. zonatus* et *Parasciadonus pauciradiatus*. Les 24 espèces sont illustrées et une clef est fournie.

## INTRODUCTION

During the explorations (1985-92) of the New Caledonian bathyal fauna 149 specimens belonging to the order Ophidiiformes were caught by the ORSTOM expeditions "BERYX 11", "BIOCAL", "CHALCAL 2", "BIOGEOCAL", "MUSORSTOM 4, 5 and 6" and "SMIB 2". The material represents three families, 15 genera and 24 species. A few of the genera are so much in need of a revision that the specific identifications are somewhat doubtful. Five new species of *Neobythites* and one of *Parasciadonus* are here described.

## MATERIAL AND METHODS

The material here examined is deposited in the Muséum national d'Histoire naturelle (MNHN), Paris, in the Museum of New Zealand (NMNZ), Wellington, and in the Zoological Museum, University of Copenhagen (ZMUC), Copenhagen. Counts and measurements follow HUBBS & LAGLER (1958) and COHEN & NIELSEN (1978) except for the vertebral count which includes the ural centra as "one" and for the measurements which use the upper jaw symphysis as the anteriormost point. The meristic characters are not given for all specimens of already described species. Detailed illustrations are made for the new species while already described species are illustrated by a less elaborate drawing.

## SYSTEMATIC ACCOUNT

## KEY TO NEW CALEDONIAN DEEPWATER OPHIDIIFORM GENERA

- |     |  |                       |
|-----|--|-----------------------|
| 1   | Scales absent  | 2                     |
| 1'  | Scales present (Ophidiidae)  | 4                     |
| 2   | Skin loose, anal fin-rays equal in length to opposing dorsal fin-rays (Aphyonidae)             | 3                     |
| 2'  | Skin not loose, anal fin-rays longer than opposing dorsal fin-rays (Carapidae)                 | <i>Pyramodon</i>      |
| 3   | Depth of body at anus 10% or more of standard length, anterior gill arch with 3-14 long rakers | <i>Aphyonus</i>       |
| 3'  | Depth of body at anus 7% or less of standard length, no long rakers on anterior gill arch      | <i>Parasciadonus</i>  |
| 4   | Ventral fins attached below eye, no large spines on operculum                                  | <i>Ophidion</i>       |
| 4'  | Ventral fins attached posterior to eye, operculum with or without spines                       | 5                     |
| 5   | Spines on operculum and preoperculum extending well posterior of head                          | 6                     |
| 5'  | Spines on operculum and preoperculum absent or present but never extending posterior of head   | 7                     |
| 6   | Prominent bifid spine on snout, ventral fins placed close together each with one ray           | <i>Acanthonus</i>     |
| 6'  | No spine on snout, ventral fins widely separated each with two rays                            | <i>Tauredophidium</i> |
| 7   | Anterior gill arch with four long rakers   | <i>Pycnocraspedum</i> |
| 7'  | Anterior gill arch with seven or more long rakers  | 8                     |
| 8   | Body long and slender, depth at anus at least ten times in standard length                     | <i>Porogadus</i>      |
| 8'  | Body less slender, depth at anus always less than ten times in standard length                 | 9                     |
| 9   | Opercular spine weak or absent   | 10                    |
| 9'  | Opercular spine strong   | 12                    |
| 10  | Head depressed and with many sharp spines  | <i>Alcockia</i>       |
| 10' | Head not depressed and without spines  | 11                    |

- 11 Preoperculum extending posteriorly almost to opercular edge, one ventral fin-ray,  
no pectoral fin-rays free.....*Bassozetus*
- 11' Preoperculum not extended posteriorly, two ventral fin-rays, lower pectoral fin-rays  
long and free.....*Bathyonus*
- 12 Lower pectoral fin-rays longer and free, ventral fin with two rays.....*Dicrolene*
- 12' Lower pectoral fin-rays not longer and free, 1-2 rays in each ventral fin.....13
- 13 Two rays in each ventral fin, two median basibranchial tooth patches.....*Neobythites*
- 13' One ray in each ventral fin, one median basibranchial tooth patch.....14
- 14 Ventral fin-ray extending beyond anus, pectoral fin placed low on body.....*Homostolus*
- 14' Ventral fin-ray not reaching halfway to anus, pectoral fin placed near midline.....*Monomitopus*

### Family CARAPIDAE

Vertical fins united, scales and supramaxilla absent, anal fin-rays longer than opposing dorsal fin-rays, oviparous.

#### Genus *PYRAMODON* Smith & Radcliffe, 1913

Ventral fins present, origin of dorsal and anal fins approximately opposite each other, pectoral fin-rays 22-30. Four species recognized (MARKLE & OLNEY, 1990: 331).

#### *Pyramodon ventralis* Smith & Radcliffe, 1913

Fig. 1

*Pyramodon ventralis* Smith & Radcliffe in Radcliffe, 1913: 175, pl. 17, fig. 3 (type locality: 0°50'S, 128°12'E).

*Pyramodon ventralis*: MARKLE & OLNEY, 1990: 334.

MATERIAL EXAMINED. — **New Caledonia**. MUSORSTOM 4: stn CP 195, 18°54.80'S, 163°22.20'E, 470 m depth, beam trawl, R. V. "Vauban", 19 September 1985: 1 specimen, female 205 mm (MNHN 1994-703).

DESCRIPTION. — Number of fin-rays in dorsal 120, anal 109, pectoral 25, vertebrae 14+51, three long rakers on anterior gill arch, anterior dorsal fin-ray above vertebra no. 5, anterior anal fin-ray below dorsal fin-ray no. 3 and vertebra no. 7. Fang-like teeth near symphysis in both jaws.

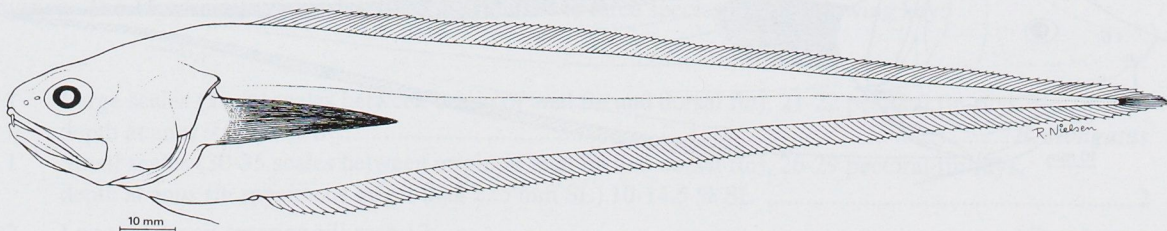


FIG. 1. — *Pyramodon ventralis* Smith & Radcliffe, 1913, female 205 mm (MNHN 1994-703).

REMARKS. — *P. ventralis* differs from all other species of *Pyramodon* by not having black margins of dorsal and anal fins and body only lightly pigmented, and by the position of the origin of the dorsal and anal fins.

DISTRIBUTION. — Known from the Indo-West Pacific on the upper continental slope.

### Family OPHIDIIDAE

Vertical fins united, scales and supramaxilla developed, dorsal fin-rays equal to or longer than opposing anal fin-rays.

### Genus *ACANTHONUS* Günther, 1878

A monotypic genus. See description below.

### *Acanthonus armatus* Günther, 1878

Fig. 2

*Acanthonus armatus* Günther, 1878: 23 (type locality: 2°33'S, 144°4'E).

*Acanthonus armatus*: SHCHERBACHEV, 1980: 109.

MATERIAL EXAMINED. — 6 specimens, 215-335 mm.

**New Caledonia.** BIOGEOCAL: stn CP 250, 21°24.63'S, 166°28.21'E, 2350 m depth, beam trawl, R. V. "Coriolis", 15 April 1987: 3 specimens, 215-335 mm (MNHN 1994-704) and 1 specimen, 250 mm (ZMUC-P.771149). — Stn CP 272, 21°00.04'S, 166°56.94'E, 1615-1710 m depth, beam trawl, 20 April 1987: 1 specimen, 260 mm (MNHN 1994-705). — Stn CP 329, 21°09.05'S, 166°40.08'E, 2310-2315 m depth, beam trawl, 4 May 1987: 1 specimen, 220 mm (MNHN 1994-706).

DESCRIPTION. — *A. armatus* is characterized by a large head and tapering body, ventral fins placed slightly posterior to orbit, bifid spine on snout, long opercular spine, and well-developed spines on lower angle of preoperculum.

DISTRIBUTION. — Numerous specimens known from the tropical parts of all oceans at depth between about 1500 and 4150 m.

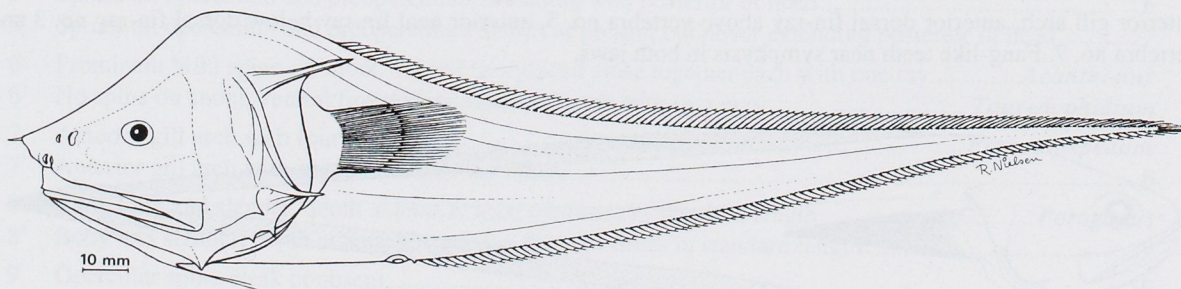


FIG. 2. — *Acanthonus armatus* Günther, 1878, 220 mm (MNHN 1994-706).

Genus *ALCOCKIA* Goode & Bean, 1896

A monotypic genus. See description below.

*Alcockia rostrata* (Günther, 1887)

Fig. 3

*Porogadus rostratus* Günther, 1887: 113, pl. 24 (type locality: 2°55'N, 124°53'E).

*Alcockia rostrata*: SHCHERBACHEV, 1980: 115.

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL: stn CP 17, 20°34.54'S, 167°24.68'E, 3680 m depth, beam trawl, R. V. "Jean Charcot", 14 August 1985: 2 specimens, female + ?, 165-207 mm (MNHN 1994-707).

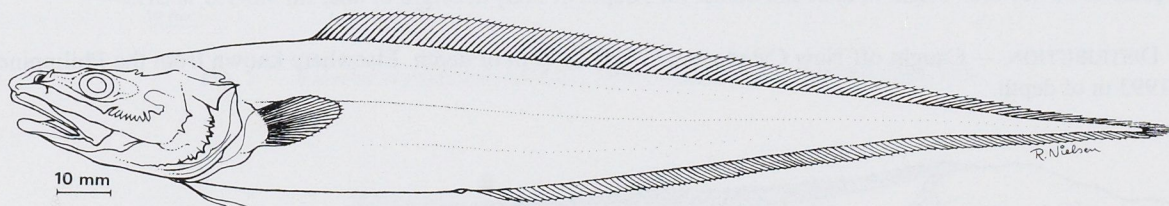


FIG. 3. — *Alcockia rostrata* (Günther, 1887), 207 mm (MNHN 1994-707).

DESCRIPTION. — An elongate fish with depressed head provided with well-developed spines, length of snout twice eye diameter, suborbital bones membranous, maxillary strongly sheathed posteriorly, and opercular spine flat and weak. Number of fin-rays in dorsal 111-112, caudal 8, anal 87-94, pectoral 23, ventral 2, vertebrae 16 + 53-56, long rakers on anterior gill arch 7, anterior dorsal fin-ray above vertebra no. 7, anterior anal fin-ray below dorsal fin-ray no. 20-22 and vertebra no. 19.

DISTRIBUTION. — A few specimens known from abyssal depths between East Africa and New Caledonia.

Genus *BASSOZETUS* Gill, 1884

Snout somewhat inflated, horizontal diameter of eye window much shorter than snout, upper jaw ends well posterior to eye, opercular spine weak or absent, preoperculum almost reaching posterior margin of operculum, ventral fins with one ray, lateral line indistinct. This genus holds 11 nominal species and is much in need of a revision. The 15 specimens here described are referred to three species in the following key:

- |    |   |                      |
|----|---|----------------------|
| 1  | Large scales (15-20 scales between origin of anal fin and dorsal fin), 21-22 pectoral fin-rays, depth at anus 9.0-9.6 % SL.....                                       | <i>B. elongatus</i>  |
| 1' | Small scales (30-35 scales between origin of anal fin and dorsal fin), 26-29 pectoral fin-rays, depth at anus (in specimens larger than 225 mm SL) 10-14.5 % SL ..... | 2                    |
| 2  | Long rakers on anterior gill arch 13 .....  | <i>B. robustus</i>   |
| 2' | Long rakers on anterior gill arch 17-21 .....   | <i>B. glutinosus</i> |

*Bassozetus elongatus* Smith & Radcliffe, 1913

Fig. 4

*Bassozetus elongatus* Smith & Radcliffe in Radcliffe, 1913: 157, pl. 11, fig. 4 (type locality: 0° 08'S, 121°19'E).

MATERIAL EXAMINED. — 3 specimens, 450-480 mm.

**New Caledonia.** BIOCAL: stn CP 05, 21°16.49'S, 166°43.56'E; 2340 m, beam trawl, R. V. "Jean Charcot", 11 August 1985: 1 specimen, male 450 mm (MNHN 1994-708). — Stn CP 72, 22°09.02'S, 167°33.18'E, 2100 m depth, beam trawl, 4 September 1985: 1 specimen, female 475 mm (MNHN 1994-709).

BIOGEOCAL: stn CP 321, 21°12'S, 166°59.85'E, 2190-2205 m depth, beam trawl, R. V. "Coriolis", 3 May 1987: 1 specimen, male 480 mm (ZMUC-P.771150).

DESCRIPTION. — Elongate body, number of dorsal fin-rays 122-128, caudal 8, anal 104-108, pectoral 21-22, vertebrae 11-12 + 56-59 (totally 68-70), long rakers on anterior gill arch 12-14, anterior dorsal fin-ray above vertebra no.4, anterior anal fin-ray below dorsal fin-ray no. 21-23 and vertebra no. 13-14, sagittal otolith small, 15-20 scale-rows between origin of anal and dorsal fins, depth of body at origin of anal fin 9.0-9.6 % SL.

DISTRIBUTION. — Caught off New Caledonia at 2100-2340 m of depth. Elsewhere known from the Philippines at 1993 m of depth.

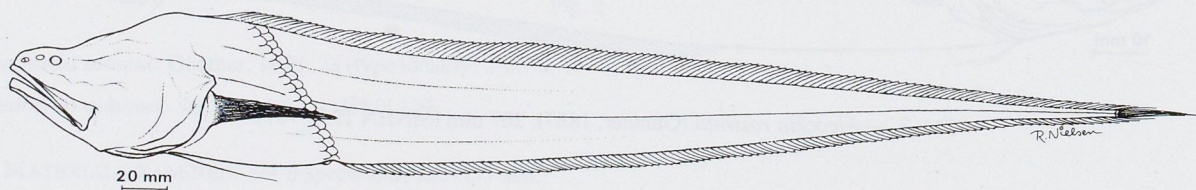


FIG. 4. — *Bassozetus elongatus* Smith & Radcliffe, 1913, female 475 mm (MNHN 1994-709).

*Bassozetus glutinosus* (Alcock, 1890)

Fig. 5

*Bathyonus glutinosus* Alcock, 1890: 211 (type locality: 18°26'N, 85°24'E).

*Bassozetus glutinosus*: SHCHERBACHEV, 1980: 119.

MATERIAL EXAMINED. — 11 specimens, 92-292 mm.

**New Caledonia.** BIOCAL: stn CP 23, 22°45.84'S, 166°20.33'E, 20-40 m depth, beam trawl, R. V. "Jean Charcot", 28 August 1985: 1 specimen, male 255 mm (MNHN 1994-710). — Stn CP 27, 22°05.52'S; 166°26.41'E, 1850 m depth, beam trawl, 28 August 1985: 2 specimens, female + ?, 145-292 mm (MNHN 1994-711) and 2 specimens, female + ?, 110-225 mm (ZMUC-P.771151-1152). — Stn CP 60, 24°01.45'S, 167°08.43'E, 1530 m depth, beam trawl, 2 September 1985: 1 specimen male 225 mm (MNHN 1994-712).

BIOGEOCAL: stn CP 260, 21°00.00'S, 167°58.34'E, 1820-1980 m depth, beam trawl, R. V. "Coriolis", 17 April 1987: 3 specimens, 150-160 mm (MNHN 1994-713). — Stn CP 265, 21°04.09'S, 167°00.40'E, 1760-1870 m depth, beam trawl, 18 April 1987: 2 specimens, 92-175 mm (MNHN 1994-714).

DESCRIPTION. — Rather elongate body, number of dorsal fin-rays 120-127, caudal 7-8, anal 101-103, pectoral 26-29, vertebrae 13-14 + 52-58 (totally 66-71), long rakers on anterior gill arch 17-21, anterior dorsal fin-ray above vertebra no.3, anterior anal fin-ray below dorsal fin-ray no. 24-26 and vertebra no. 14-16, sagittal otolith small, 30-35 scale-rows between origin of anal and dorsal fins, depth of body at origin of anal fin 8.7-12.4 % SL.

REMARKS. — The depth of body shows a distinct positive allometric growth. It is not possible to compare this character among the three present *Bassozetus* spp. as all the specimens of *B. glutinosus* are much shorter than any of the specimens representing the other two species.

DISTRIBUTION. — Caught off New Caledonia at 1530-2040 m of depth. Elsewhere known from off East Africa to Hawaii (?).

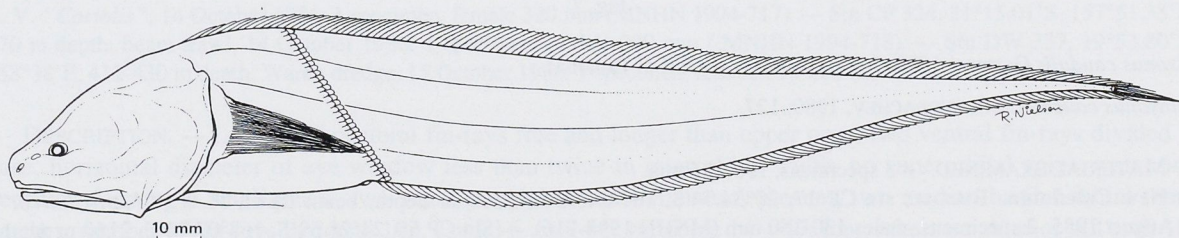


FIG. 5. — *Bassozetus glutinosus* (Alcock, 1890), male 255 mm (MNHN 1994-710).

***Bassozetus robustus* Smith & Radcliffe, 1913**

Fig. 6

*Bassozetus robustus* Smith & Radcliffe in Radcliffe, 1913: 156, pl. 11, fig. 3 (type locality: 10°54'N, 118°26'20''E).

*Bassozetus robustus*: SHCHERBACHEV, 1980: 122.

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL: stn CP 58, 23°55.86'S, 166°41.71'E, 2750 m depth, beam trawl, R. V. "Coriolis", 2 September 1985: 1 specimen, female 520 mm (MNHN 1994-715).

DESCRIPTION. — Body robust, number of dorsal fin-rays 115, caudal 8, anal 96, pectoral 27, vertebrae 15 + 49, long rakers on anterior gill arch 13, anterior dorsal fin-ray above vertebra no. 4, anterior anal fin-ray below dorsal fin-ray no. 25 and vertebra no. 17, sagittal otolith large, 30-35 scale-rows between origin of anal and dorsal fins, depth of body at origin of anal fin 14.5 % SL.

DISTRIBUTION. — Caught off New Caledonia at 2750 m of depth. Elsewhere known from the Philippines and from off West Australia to off the east coast of Africa at depths from 1332-2350 m.

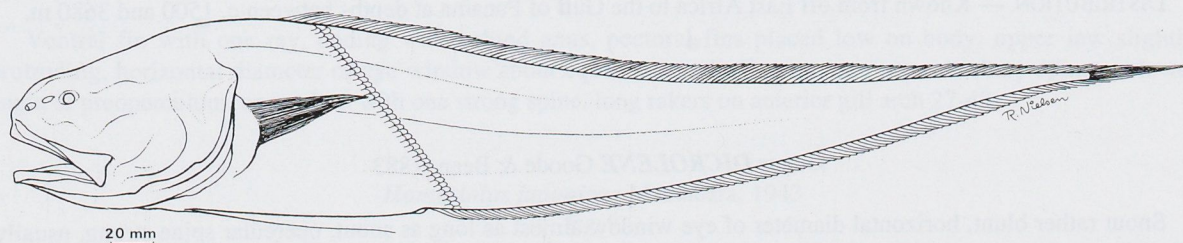


FIG. 6. — *Bassozetus robustus* Smith & Radcliffe, 1913, female 520 mm (MNHN 1994-715)

Genus *BATHYONUS* Goode & Bean, 1886

Elongate body, no spines on head except for a weak opercular spine, horizontal diameter of eye window smaller than length of snout, lower rays of pectoral fin long and free, two ventral fin-rays, six caudal fin-rays.

*Bathyonus caudalis* (Garman, 1899)

Fig. 7

*Mixonus caudalis* Garman, 1899: 148 (type locality: Gulf of Panama).

*Bathyonus caudalis*: SHCHERBACHEV, 1980: 127.

MATERIAL EXAMINED. — 3 specimens, 130-195 mm.

**New Caledonia.** BIOCAL: stn CP 17, 20°34.54'S, 167°24.68'E, 3680 m depth, beam trawl, R. V. "Jean Charcot", 14 August 1985: 2 specimens, males 130-150 mm (MNHN 1994-716). — Stn CP 63, 24°28.69'S, 168°07.72'E, 2160 m depth, beam trawl, 2 September 1985: 1 specimen, male 195 mm (ZMUC-P.77846).

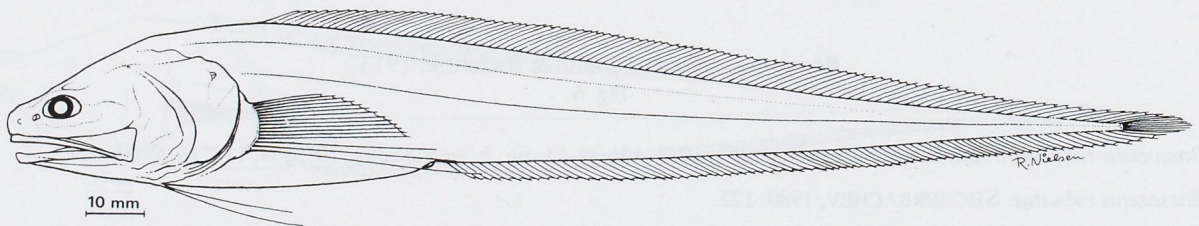


FIG. 7. — *Bathyonus caudalis* (Garman, 1899), male 195 mm (ZMUC-P.77846).

DESCRIPTION. — Scales small (about 30 between origin of anal and dorsal fins), number of fin-rays in dorsal 100, caudal 6, anal 80, pectoral 13-15 + 3 lower rays longer and free, ventral 2, vertebrae 17 + 46, long rakers on anterior arch 13-14, anterior dorsal fin-ray above vertebra no. 6, anterior anal fin-ray below dorsal fin-ray no. 24 and vertebra no. 20.

REMARKS. — Three nominal species are assigned this genus (COHEN & NIELSEN, 1978). According to SHCHERBACHEV (1980) the high number of long gill rakers and the small scales indicate that the present material belongs to *B. caudalis*.

DISTRIBUTION. — Known from off East Africa to the Gulf of Panama at depths between c. 1500 and 3680 m.

Genus *DICROLENE* Goode & Bean, 1883

Snout rather blunt, horizontal diameter of eye window almost as long as snout, opercular spine strong, usually three sharp spines on hind margin of preoperculum, lower 5-11 pectoral fin-rays free, two rays in each ventral fin, a paired set and 1-2 median basibranchial tooth patches.



*Dicrolene longimana* Smith & Radcliffe, 1913

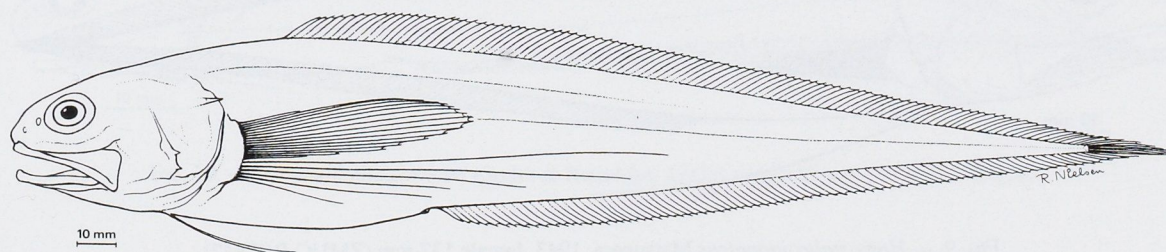
Fig. 8

*Dicrolene longimana* Smith & Radcliffe in Radcliffe, 1913: 144, pl. 8 (type locality: 10°N, 125°06.75'E).*Dicrolene longimana*: SHCHERBACHEV, 1980: 134.

MATERIAL EXAMINED. — 3 specimens, 290-320 mm.

**Chesterfield and Bellona Plateaus.** MUSORSTOM 5: stn CP 323, 21°18.52'S, 157°57.62'E, 970 m depth, beam trawl, R. V. "Coriolis", 14 October 1986: 1 specimen, female 320 mm (MNHN 1994-717). — Stn CP 324, 21°15.01'S, 157°51.33'E, 970 m depth, beam trawl, 14 October 1986: 1 specimen, female 290 mm (MNHN 1994-718). — Stn DW 337, 19°53.80'S, 158°38'E, 412-430 m depth, Waren dredge, 15 October 1986: 1 specimen, female 310 mm (ZMUC-P.771148).

DESCRIPTION. — Lower 6-7 pectoral fin-rays free and longer than upper ones, two ventral fin-rays divided to base, horizontal diameter of eye window less than twice in interorbital width, no superorbital spine, vomerine dentition forming a small patch, two small pseudobranchial filaments present, two median basibranchial tooth patches, number of fin-rays in dorsal 102, caudal 6, anal 81, vertebrae 14 + 47, long rakers on anterior gill arch 10-11, anterior dorsal fin-ray above vertebra no. 8, anterior anal fin-ray below dorsal fin-ray no. 20 and vertebra no. 17.

FIG. 8. — *Dicrolene longimana* Smith & Radcliffe, 1913, female 290 mm (MNHN 1994-718).

REMARKS. — The specimens are identified according to SHCHERBACHEV (1980) and NIELSEN & HUREAU (1980). A revision of the genus holding 15 nominal species is much needed.

DISTRIBUTION. — Known from off East Africa, the Philippines, New Caledonia and a questionable record from the Peru-Chile trench (NALBANT & MAYER, 1971) at depths between 412 and 1408 m.

Genus *HOMOSTOLUS* Smith & Radcliffe, 1913

Ventral fin with one ray, ending well behind anus, pectoral fins placed low on body, upper jaw slightly protruding, horizontal diameter of eye window about equal to length of snout, one or more sharp spines at lower angle of preoperculum, operculum with one strong spine, long rakers on anterior gill arch 27-42.

*Homostolus japonicus* Matsubara, 1943

Fig. 9

*Homostolus japonicus* Matsubara, 1943: 47, fig. in Kamohara (1938: 68) (type locality: Heta, Japan).

MATERIAL EXAMINED. — 23 specimens, 117-185 mm.

**Chesterfield and Bellona Plateaus.** MUSORSTOM 5: stn CP 358, 19°38.39'S, 158°47.17'E, 680-700 m depth, beam trawl, R. V. "Coriolis", 18 October 1986: 1 specimen, female 140 mm (MNHN 1994-719). — Stn CC 365, 19°42.82'S, 158°48'S, 710 m depth, otter trawl, 19 October 1986: 11 specimens, 5 females and 6 males, 117-185 mm (MNHN 1994-720). — Stn CC 366, 19°45.40'S, 158°45.62'E, 650 m depth, otter trawl, 19 October 1986: 3 specimens, females 152-161 mm (MNHN 1994-721). — Stn CC 383, 19°40.85'S, 158°46.10'E, 600-615 m depth, otter trawl, 21 October 1986: 3 specimens, females 138-163 mm (MNHN 1994-722). — Stn CC 384, 19°42.40'S, 158°50.80'E, 756-772 m depth, otter trawl, 21 October 1986: 1 specimen, female 163 mm (MNHN 1994-723). — Stn CP 387, 20°53.41'S, 160°52.14'E, 650-660 m depth, beam trawl, 22 October 1986: 4 specimens, 2 females + 2 males, 137-169 mm (ZMUC-P.77847-850).

DESCRIPTION. — Number of dorsal fin-rays 94-95, caudal 8, anal 76-78, pectoral 21-22, vertebrae 13 + 42-43, long rakers on anterior gill arch 36-42, anterior dorsal fin-ray above vertebra no. 5-6, anterior anal fin-ray below dorsal fin-ray no. 20 and vertebra no. 16-17, length of head 23-27.5 % and length of ventral fin-rays 28-36 % SL.

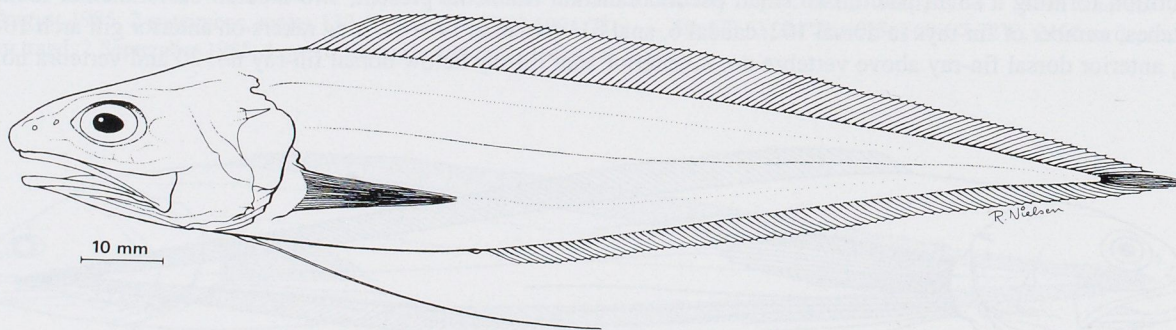


FIG. 9. — *Homostolus japonicus* Matsubara, 1943, female 137 mm (ZMUC-P.77847).

REMARKS. — *H. japonicus* can be separated from the only other species within the genus, *H. acer* Smith & Radcliffe in Radcliffe, 1913, by the larger number of long gill rakers (36-42 vs 27) and the longer head (23-27.5 % SL vs 22 % SL).

DISTRIBUTION. — Known from off Japan and New Caledonia at depth between 300 and 772 m.

#### Genus *MONOMITOPUS* Alcock, 1890

Rather robust fish, horizontal diameter of eye window equal to or slightly shorter than snout, opercular spine strong, 2-3 more or less well-developed spines on lower angle of preoperculum, one median basibranchial tooth patch, ventral fins with 1-2? rays in each.

#### *Monomitopus garmani* (Smith & Radcliffe, 1913)

Fig. 10

*Monomeropus garmani* Smith & Radcliffe in Radcliffe, 1913: 151, pl. 10, fig. 1 (type locality: 0°36'S, 122°1'N).

MATERIAL EXAMINED. — 24 specimens, 95-192 mm.

**New Caledonia.** BIOCAL: stn CP 31, 23°7.26'S, 166°50.45'E, 850 m depth, beam trawl, R. V. "Jean Charcot", 29 August 1985: 2 specimens, males 141-157 mm (MNHN 1994-724). — Stn CP 54, 23°10.30'S, 167°42.98'E, 1000 m depth, beam trawl, 1 September 1985: 1 specimen, female 169 mm (MNHN 1994-725). — Stn CP 61, 24°11.67'S, 167°31.37'E, 1070 m depth, beam trawl, 2 September 1985: 2 specimens, female + male, 160+ & 192 mm (ZMUC-P.77851-852). — Stn CP 69, 23°51.38'S, 167°58.68'E, 1225 m depth, beam trawl, 3 September 1985: 1 specimen, female 168 mm (MNHN 1994-726). — Stn CP 75, 22°18.65'S, 167°23.30'E, 825 m depth, beam trawl, 4 September 1985: 6 specimens, 4 females + 1 male + ?, 148-164 mm (MNHN 1994-727).

**Norfolk Ridge.** BERYX 11: stn CP 58, 23°19.2' - 20.3'S, 167°59.4' - 58.4'E (Aztèque seamount), 850-920 m depth, beam trawl, R. V. "Alis", 22 October 1992: 2 specimens, males 158-167 mm (NMNZ-P.29048 and P.29166).

**Chesterfield and Bellona Plateaus.** MUSORSTOM 5: stn CP 323, 21°18.52'S, 157°57.62'E, 970 m depth, beam trawl, R. V. "Coriolis", 14 October 1986: 4 specimens, females 95-139 mm (MNHN 1994-728). — Stn CP 324, 21°15.01'S, 157°51.33'E, 970 m depth, beam trawl, 14 October 1986: 6 specimens, 3 females + 3 males, 112+ - 145 mm (MNHN 1994-729).

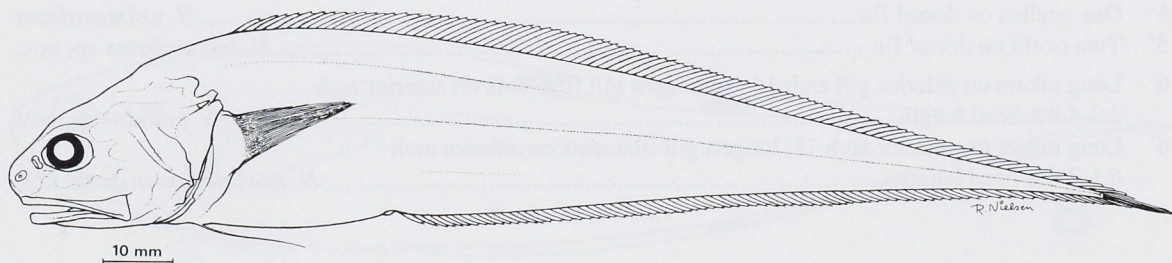


FIG. 10. — *Monomitopus garmani* (Smith & Radcliffe, 1913), male 158 mm (NMNZ-P.29166).

**DESCRIPTION.** — Number of fin-rays in dorsal 92-96, caudal 7-8, anal 76-82, pectoral 29-32, precaudal vertebrae 12, total vertebrae 57-58, long, slender rakers on anterior gill arch 15-18 (not including the 3-4 relatively long, robust rakers on dorsal branch), pseudobranchial filaments 2, anterior dorsal fin-ray above vertebra no. 5-6, anterior anal fin-ray below dorsal fin-ray no. 16-19 and below vertebra no. 15. Head 20.5-22.5 % and horizontal eye diameter 4.3-5.0 % SL.

**REMARKS.** — This genus holds 14 nominal species which are mainly separated by meristic characters and length of eye and head. The genus is much in need of a revision.

**DISTRIBUTION.** — Known from Celebes to New Caledonia at depths between 825 and 1220 m.

#### Genus *NEOBYTHITES* Goode & Bean, 1886

Body short, mouth terminal, strong, straight opercular spine, horizontal diameter of eye window equal to or slightly shorter than length of snout, two rays in each ventral fin, two median basibranchial tooth patches. A more thorough description of the genus is given by NIELSEN (1995).

*Neobythites* is known from 61 specimens from off New Caledonia representing seven species five of which are new and here described. Since these species will be included in a future paper on the *Neobythites* spp. from the East Indian and Pacific Oceans the following descriptions are relatively short.

KEY TO THE NEW CALEDONIAN SPECIES OF *NEOBYTHITES*

- 1 Ventral fin-rays reaching beyond anus; dorsal part of body mottled; two ocelli in dorsal fin with the anterior placed at origin of fin ..... *N. longiventralis* sp. nov.
- 1' Ventral fin not reaching anus; body not mottled; 0-2 ocelli in dorsal fin with the anterior placed posterior to anus ..... 2
- 2 No spines on hind margin of preoperculum; pectoral rays 33-34; 7-8 long gill rakers..... *N. bimarginatus*
- 2' Two spines on hind margin of preoperculum; pectoral fin-rays 25-29; 10-16 long gill rakers ..... 3
- 3 Dorsal fin with about four dark blotches or ocelli continuing on body as dark, vertical bars ..... *N. zonatus* sp. nov.
- 3' No dark, vertical bars on body ..... 4
- 4 1-2 ocelli on dorsal fin..... 5
- 4' No ocelli on dorsal fin ..... 6
- 5 One ocellus on dorsal fin ..... *N. unimaculatus*
- 5' Two ocelli on dorsal fin ..... *N. bimaculatus* sp. nov.
- 6 Long rakers on anterior gill arch 14-16; longest gill filaments on anterior arch 2.8-4.8% head length ..... *N. pallidus* sp. nov.
- 6' Long rakers on anterior arch 11; longest gill filaments on anterior arch 6.1-7-6% head length..... *N. neocaledoniensis* sp. nov.

*Neobythites bimaculatus* sp. nov.

Figs 11a-b

MATERIAL EXAMINED. — 5 specimens, 73-170 mm.

**New Caledonia.** MUSORSTOM 4: stn CP 241, 22°9'S, 167°12.2'E, 470-480 m depth, beam trawl, R. V. "Vauban", 3 October 1985: holotype, female 128 mm (MNHN 1994-730). — Stn CP 243, 22°2.8'S, 167°7.7'E 435-450 m depth, beam trawl, 3 October 1985: 2 paratypes, females 73-155 mm (MNHN 1994-731) and 1 paratype, female 115 mm (ZMUC-P.771153). — Stn CC 247, 22°9'S, 167°13.3'E, 435-460 m depth, otter trawl, 4 October 1985: 1 paratype, female 170 mm (MNHN 1994-732).

**DIAGNOSIS.** — *N. bimaculatus* differs from all other *Neobythites* species by the following combination of characters: Number of dorsal fin-rays 100-105, anal 86-92, two spines on hind margin of preoperculum, 10-12 long raker on anterior gill arch, six small pseudobranchial filaments, two ocelli placed on middle third of dorsal fin.

**DESCRIPTION.** — The main meristic and morphometric characters are shown in Table 1. Holotype (Fig. 11a): Snout rather blunt about as long as horizontal diameter of eye window. Upper jaw ends just posterior to eye. Lateral line indistinct. Teeth granular. Anterior gill arch with three short and two long rakers on dorsal branch, one long raker in angle and ventral branch with eight long and six short rakers. Two distinct ocelli on dorsal fin. Upper part of head and body mottled brown indicating about ten vertical, brown bands. Posteriormost part of dorsal and anal fins and caudal fin dark. Paratypes (only major differences from holotype will be mentioned): The three smallest paratypes have 12-15 more distinct brown, vertical bands on upper part of body. Furthermore, the 73 mm paratype has two less distinct ocelli on anal fin (Fig. 11b).

**ETYMOLOGY.** — The specific name refers to the two ocelli on the dorsal fin.

**DISTRIBUTION.** — Known from off New Caledonia between 435 and 480 m of depth.

REMARKS. — *N. bimaculatus* seems most closely related to *N. crosnieri* Nielsen, 1994 with which it shares the two preopercular spines and the two ocelli on the dorsal fin. They differ by the position of the two ocelli which is on the middle third of the dorsal fin in *bimaculatus* while it is on the posterior third in *crosnieri*.

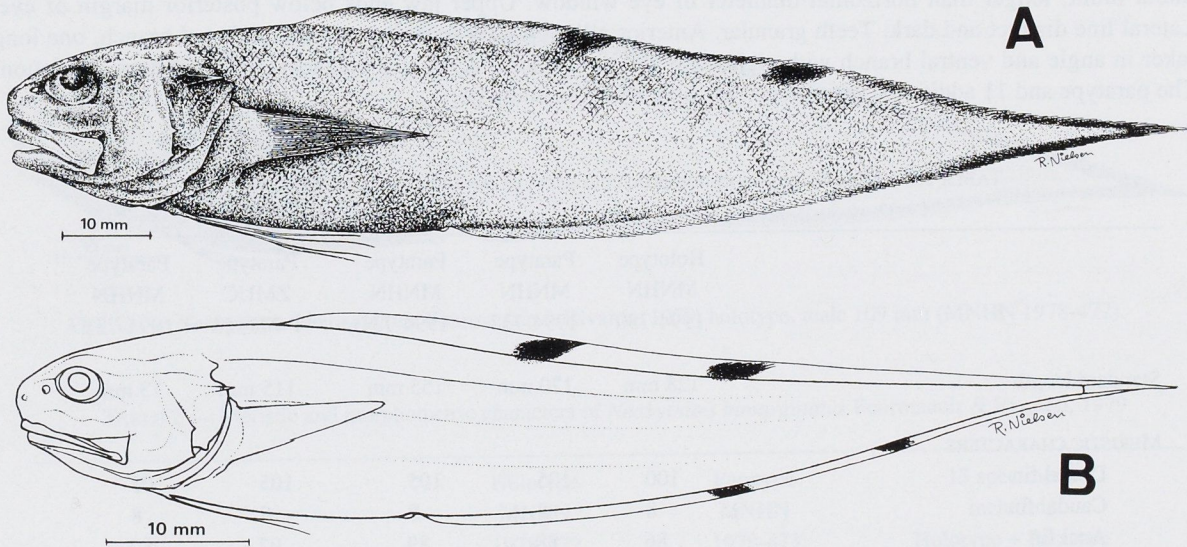


FIG. 11. — *Neobythites bimaculatus* sp. nov. — **A**: holotype, female 128 mm (MNHN 1994-730). — **B**: paratype, female 73 mm (MNHN 1994-731).

*Neobythites bimarginatus* Fourmanoir & Rivaton, 1979

Fig. 12

*Neobythites bimarginatus* Fourmanoir & Rivaton, 1979: 416, fig. 9 (type locality: west of Ile des Pins, New Caledonia).

MATERIAL EXAMINED. — 13 specimens, 76-110 mm.

**New Caledonia.** West of Pins Island: 360 m depth, trawl, 13 April 1978: holotype, male 109 mm (MNHN 1978-472). — Paratype, male 97 mm (MNHN 1978-473), same data as holotype. The holotype and paratype of *N. bimarginatus* are the only ophidioid specimens here treated which were not caught by the expeditions mentioned in the introduction. MUSORSTOM 4: stn CP 213, 22°51.3'S, 167°12'E, 405-530 m depth, beam trawl, R. V. "Vauban", 28 September 1985: 2 specimens, females 89-98 mm (MNHN 1994-733). — Stn CP 214, 22°53.8'S, 167°13.9'E, 425-440 m depth, beam trawl, 28 September 1985: 1 specimen, female 92 mm (MNHN 1994-734).

**Chesterfield and Bellona Plateaus.** MUSORSTOM 5: stn CP 311, 22°13.6'S, 159°23.9'E, 320 m depth, beam trawl, R. V. "Coriolis", 12 October 1986: 2 specimens, female and male, 102 and 110 mm (MNHN 1994-735) and 1 specimen, female 76 mm (ZMUC-P.771154) — Stn DW 339, 19°53.4'S, 158°37.9'E, 380-395 m depth, epibenthic dredge, 16 October 1986: 1 specimen, female 77 mm (MNHN 1994-736).

**Norfolk Ridge.** CHALCAL 2: stn CP 26, 23°18.15'S, 168°3.58'E, 296 m depth, beam trawl, R. V. "Coriolis", 31 October 1986: 2 specimens, female + ?, 90 and 87 mm (MNHN 1994-737) and 1 specimen, male 85 mm (ZMUC-P.771155).

**Loyalty Islands.** MUSORSTOM 6: stn DW 478, 21°8.96'S, 167°54.28'E, 400 m depth, epibenthic dredge, R. V. "Alis", 22 February 1989: 1 specimen, female 86 mm (MNHN 1994-738).

DIAGNOSIS. — *N. bimarginatus* differs from all other *Neobythites* species by having 33-34 pectoral fin-rays, anterior anal fin-ray below dorsal fin-ray no. 23-25, distal and proximal parts of dorsal and anal fins light and middle part black, and median part of body immediately behind head with 6-7 light areas.

DESCRIPTION. — The main meristic and morphometric characters are shown in Table 2. Holotype (Fig. 12): Snout blunt, longer than horizontal diameter of eye window. Upper jaw ends below posterior margin of eye. Lateral line distinct and dark. Teeth granular. Anterior gill arch with four short rakers on dorsal branch, one long raker in angle and ventral branch with eight long and three short rakers. See diagnosis for coloration. Variation: The paratype and 11 additional specimens vary little from the holotype.

TABLE 1. — Meristic and morphometric characters of *Neobythites bimaculatus* sp. nov.

|   | Holotype<br>MNHN<br>1994-730 | Paratype<br>MNHN<br>1994-732 | Paratype<br>MNHN<br>1994-731 | Paratype<br>ZMUC<br>P 771153 | Paratype<br>MNHN<br>1994-731 |
|---|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
| Standard length                         | 128 mm                       | 170 mm                       | 155 mm                       | 115 mm                       | 73 mm                        |
| MERISTIC CHARACTERS                     |                              |                              |                              |                              |                              |
| Dorsal fin                              | 100                          | 105                          | 105                          | 105                          | 105                          |
| Caudal fin                              | 8                            | 8                            | 8                            | 8                            | 8                            |
| Anal fin                                | 86                           | 88                           | 89                           | 92                           | 89                           |
| Pectoral fin                            | 27                           | 27                           | 27                           | 28                           | 27                           |
| Pseudobranchial filaments               | 6                            | 6                            | 6                            | 6                            | -                            |
| Precaudal vertebrae                     | 13                           | 13                           | 13                           | 13                           | 13                           |
| Total vertebrae                         | 61                           | 62                           | 62                           | 62                           | 61                           |
| Developed rakers on anterior gill arch  | 11                           | 11                           | 12                           | 11                           | 10                           |
| Anterior dorsal ray above vertebra n°   | 5                            | 5                            | 6                            | 5                            | 5                            |
| Anterior anal ray below dorsal ray n°   | 18                           | 19                           | 19                           | 19                           | 19                           |
| Anterior anal ray below vertebra n°     | 15                           | 15                           | 15                           | 15                           | 15                           |
| MORPHOMETRIC CHARACTERS                 |                              |                              |                              |                              |                              |
| In % of SL                              |                              |                              |                              |                              |                              |
| Head length                             | 22.5                         | 22.0                         | 22.0                         | 21.0                         | 21.0                         |
| Depth at anus                           | 16.5                         | 17.0                         | 16.0                         | 14.5                         | 15.0                         |
| Upper jaw                               | 11.0                         | 11.0                         | 10.5                         | 10.5                         | 10.5                         |
| Horizontal eye window                   | 4.8                          | 4.5                          | 4.7                          | 4.2                          | 4.9                          |
| Preanal                                 | 40.0                         | 42.0                         | 41.0                         | 38.0                         | 38.5                         |
| Predorsal                               | 25.0                         | 24.5                         | 24.5                         | 23.5                         | 24.0                         |
| Length of ventral fin                   | 16.0                         | 15.5                         | 15.0                         | 15.0                         | 13.0                         |
| Snout to 1st ocellus                    | 48.5                         | 48.5                         | 47.5                         | 44.5                         | 45.0                         |
| Snout to 2nd ocellus                    | 66                           | 68                           | 68                           | 61                           | 63                           |
| In % of head-length                     |                              |                              |                              |                              |                              |
| Longest gill filaments on anterior arch | 6.0                          | 6.4                          | 5.9                          | 6.7                          | 6.5                          |

BIOLOGY. — *N. bimarginatus* occurs on the upper part of the continental shelf (296-530 m). The presence of gastropods in several specimens shows that it feeds on the bottom. It seems to be a small species as it has well developed gonads at a standard length of about 100 mm and specimens exceeding 110 mm are not known.

DISTRIBUTION. — *N. bimarginatus* is known from off New Caledonia and a few neighbouring islands, caught in bottom fishing gear.

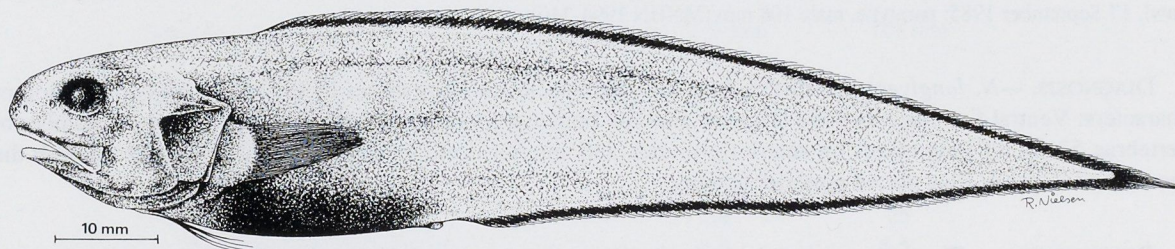


FIG. 12. — *Neobythites bimarginatus* Fourmanoir & Rivaton, 1979, holotype, male 109 mm (MNHN 1978-472).

TABLE 2. — Meristic and morphometric characters of *Neobythites bimarginatus* Fourmanoir & Rivaton, 1979.

|   | Holotype<br>MNHN<br>1978-472 | Paratype<br>MNHN<br>1978-473 | 13 specimens<br>including<br>Holotype + Paratype |         |         |
|---|------------------------------|------------------------------|--|---------|---------|
| Standard length                         | 109 mm                       | 97 mm                        | 76-110 mm  |         |         |
| MERISTIC CHARACTERS                     |                              |                              |  |         |         |
|   |                              |                              | Minimum  | (Mean)  | Maximum |
| Dorsal fin                              | 107                          | 107                          | 106  | (107.8) | 110     |
| Caudal fin                              | 8                            | 8                            |  | (8.0)   |         |
| Anal fin                                | 86                           | 87                           | 86   | (87.5)  | 90      |
| Pectoral fin                            | 33                           | 33                           | 32   | (32.9)  | 34      |
| Pseudobranchial filaments               | 2                            | 2                            |  | (2.0)   |         |
| Precaudal vertebrae                     | 13                           | 14                           | 13   | (13.9)  | 14      |
| Total vertebrae                         | 59                           | 61                           | 59   | (60.5)  | 62      |
| Developed rakers on anterior gill arch  | 9                            | 8                            | 6  | (8.0)   | 9       |
| Anterior dorsal ray above vertebra n°   | 4                            | 4                            | 3  | (3.4)   | 4       |
| Anterior anal ray below dorsal ray n°   | 25                           | 24                           | 23   | (23.8)  | 25      |
| Anterior anal ray below vertebra n°     | 14                           | 16                           | 15   | (15.5)  | 16      |
| MORPHOMETRIC CHARACTERS                 |                              |                              |  |         |         |
| In % of SL                              |                              |                              |  |         |         |
| Head length                             | 19.5                         | 20.5                         | 19.0   | (19.9)  | 21.0    |
| Depth at anus                           | 16.0                         | 15.5                         | 14.5   | (15.7)  | 17.5    |
| Upper jaw                               | 8.9                          | 9.7                          | 8.9  | (9.4)   | 10.5    |
| Horizontal eye window                   | 4.0                          | 4.6                          | 4.0  | (4.8)   | 5.3     |
| Preal anal                              | 39.5                         | 41.5                         | 37.5   | (40.0)  | 43.5    |
| Predorsal                               | 20.5                         | 22.5                         | 19.0   | (21.7)  | 23.5    |
| In % of head-length                     |                              |                              |  |         |         |
| Longest gill filaments on anterior arch | 6.5                          | 5.5                          | 4.9  | (5.5)   | 6.3     |

*Neobythites longiventralis* sp. nov.

Fig. 13

MATERIAL EXAMINED. — 2 specimens, 108-137 mm.

**New Caledonia.** MUSORSTOM 4: stn CP 192, 18°59.3'S, 163°25'E, 320 m depth, beam trawl, R. V. "Vauban", 19 September 1985: holotype, female 137 mm (MNHN 1994-739). — Stn CP 172, 19°1.2'S, 163°16'E, 275-330 m depth, beam trawl, 17 September 1985: paratype, male 108 mm (MNHN 1994-740).

**DIAGNOSIS.** — *N. longiventralis* differs from all other species of *Neobythites* by the following combination of characters: Ventral fins reach beyond origin of anal fin, hind margin of preoperculum with two spines, number of vertebrae 53-54, 11 long rakers on anterior gill arch, and anterior ocellus placed at origin of dorsal fin with the second and larger ocellus placed posterior to anus.

**DESCRIPTION.** — The main meristic and morphometric characters are shown in Table 3. Holotype (Fig. 13): Snout rather blunt, a little longer than horizontal diameter of eye window. Upper jaw ends well behind posterior margin of eye. Lateral line light. Teeth granular. Vomer subtriangular. Anterior gill arch with 4-5 short and two long rakers on dorsal branch, one long raker in angle and ventral branch with eight long and five extremely short rakers. Dorsal part of head and body mottled brown; ventral part more uniformly brown. Dorsal fin with irregular dark areas besides two ocelli; lips dark. Paratype: The only major variation from the holotype is that the two ocelli are almost equal in size.

**BIOLOGY.** — Gastropods were found in the intestine of the holotype.

**ETYMOLOGY.** — The specific name refers to the long ventral fin-rays.

**DISTRIBUTION.** — Known from two New Caledonian localities trawled at 275-330 m of depth.

**REMARKS.** — Two additional species of *Neobythites* have ventral fins ending posterior to anus. Of these *N. longipes* Smith & Radcliffe in Radcliffe, 1913 from the Philippines can be distinguished by having one ocellus in dorsal fin and one weak preopercular spine only, and *N. stelliferoides* Gilbert, 1890 from the East Pacific has neither ocelli nor preopercular spines.

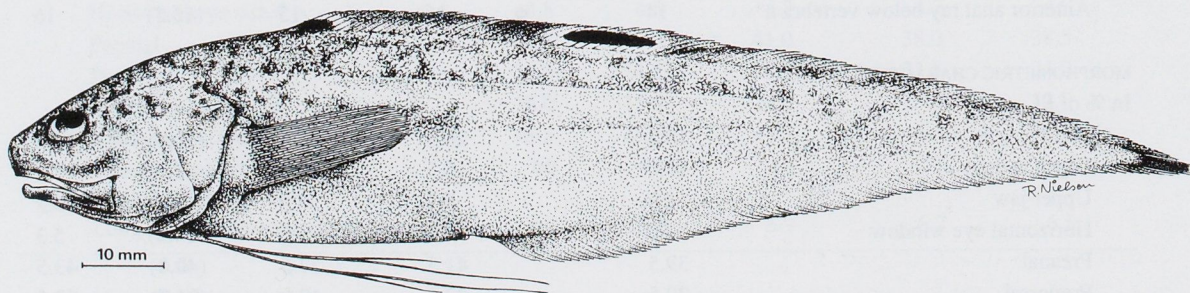


FIG. 13. — *Neobythites longiventralis* sp. nov., holotype, female 137 mm (MNHN 1994-739).



TABLE 3. — Meristic and morphometric characters of *Neobythites longiventralis* sp. nov.

|   | Holotype<br>MNHN<br>1994-739 | Paratype<br>MNHN<br>1994-740 |
|---|------------------------------|------------------------------|
| Standard length                         | 137 mm                       | 108 mm                       |
| MERISTIC CHARACTERS                     |                              |                              |
| Dorsal fin                              | 91                           | 92                           |
| Caudal fin                              | 8                            | 8                            |
| Anal fin                                | 76                           | 76                           |
| Pectoral fin                            | 26                           | 25                           |
| Pseudobranchial filaments               | 4-5                          | 5-5                          |
| Precaudal vertebrae                     | 13                           | 13                           |
| Total vertebrae                         | 54                           | 53                           |
| Developed rakers on anterior gill arch  | 11                           | 11                           |
| Anterior dorsal ray above vertebra n°   | 5                            | 5                            |
| Anterior anal ray below dorsal ray n°   | 20                           | 20                           |
| Anterior anal ray below vertebra n°     | 15                           | 15                           |
| MORPHOMETRIC CHARACTERS                 |                              |                              |
| In % of SL                              |                              |                              |
| Head length                             | 23.0                         | 22.0                         |
| Depth at anus                           | 18.5                         | 15.5                         |
| Upper jaw                               | 12.5                         | 11.5                         |
| Horizontal eye window                   | 4.7                          | 5.1                          |
| Preventral                              | 18.5                         | 18.0                         |
| Preanal                                 | 43.0                         | 42.0                         |
| Predorsal                               | 26.5                         | 26.0                         |
| Length of ventral fin                   | 32.0                         | 27.5                         |
| Snout to 1st ocellus                    | 28.5                         | 27.5                         |
| Snout to 2nd ocellus                    | 50.0                         | 47.0                         |
| In % of head-length                     |                              |                              |
| Longest gill filaments on anterior arch | 7.9                          | 8.3                          |

*Neobythites neocaledoniensis* sp. nov.

Fig. 14

MATERIAL EXAMINED. — 8 specimens, 124-245 mm.

**New Caledonia.** MUSORSTOM 4: stn CP 194, 18°52.8'S, 163°21.7'E, 550 m depth, beam trawl, R. V. "Vauban", 19 September 1985: holotype, female 169 mm (MNHN 1994-741). — 2 paratypes, female and male, 195 and 245 mm (MNHN 1994-742) and 1 paratype, female 145 mm (ZMUC-P.771156), same data as holotype. — Stn CP 195, 18°54.8'S, 163°22.2'E, 470 m depth, beam trawl, 19 September 1985: 1 paratype, female 124 mm (MNHN 1994-743). — Stn CC 201, 18°55.80'S, 163°13.80'E, 500 m depth, otter trawl, 20 September 1985: 1 paratype, male 162 mm (MNHN 1994-744).

**Norfolk Ridge.** BERYX 11: stn CP 7, 24°54.8'S, 168°21.3'E (Seamount "B"), 540-670 m depth, beam trawl, R. V. "Alis", 15 October 1992: 2 paratypes, females 125-132 mm (NMNZ-P.29201).

DIAGNOSIS. — *N. neocaledoniensis* differs from all other *Neobythites* species by the following combination of characters: Number of dorsal fin-rays 102-106, anal 87-90, two spines on hind margin of preoperculum, 11 long rakers on anterior gill arch, no ocelli or spots on fins or bands on body.

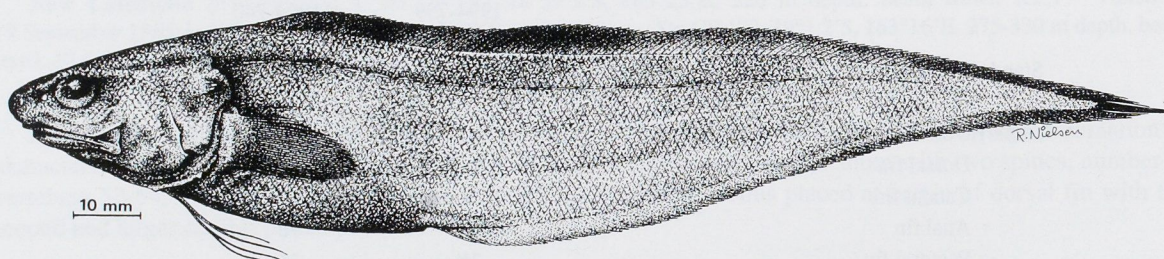


FIG. 14. — *Neobythites neocaledoniensis* sp. nov., holotype, female 169 mm (MNHN 1994-741).

DESCRIPTION. — The main meristic and morphometric characters are shown in Table 4. Holotype (Fig. 14): Snout pointed, longer than horizontal diameter of eye window. Upper jaw ends well behind eye. Lateral line distinct. Teeth granular. Vomer subtriangular. Anterior gill arch with three short and two long rakers on dorsal branch, one long raker in angle and ventral branch with eight long and three short rakers. Body and head brown, darker above than below and no ocelli or spots. Paratypes: All paratypes are very similar to the holotype except for a 245 mm specimen (MNHN 1994-742) in which there are two faint black spots on dorsal fin and seven (vs 3-4) pseudobranchial filaments much smaller than in the other paratypes.

BIOLOGY. — Various gastropods and remains of crustaceans were found in the intestine of most specimens.

ETYMOLOGY. — The specific name refers to the type locality.

DISTRIBUTION. — Caught on three localities off New Caledonia and once a little further south on the Norfolk Ridge at depths between 470 and 670 m.

REMARKS. — *N. neocaledoniensis* differs from all other *Neobythites* species with two preopercular spines and no ocelli or vertical bars on body by having more rays in dorsal and anal fins (vs. *N. purus* Smith & Radcliffe in Radcliffe, 1913 and *N. sivicola* (Jordan & Snyder, 1901)) and by having fewer long rakers on anterior gill arch and more coloration (vs. *N. pallidus*, see below).

#### *Neobythites pallidus* sp. nov.

Fig. 15a-b

MATERIAL EXAMINED. — 17 specimens, 102-143 mm.

**New Caledonia.** MUSORSTOM 4: stn CP 198, 18°49.4'S, 163°18.8'E, 590 m depth, beam trawl, R. V. "Vauban", 20 September 1985: holotype, male 135 mm (MNHN 1994-745). — Stn. CP 158, 18°49.3'S, 163°15'E, 620 m depth, beam trawl, 15 September 1985: 1 paratype, female 123 mm (MNHN 1994-746). — 2 paratypes, females 116-132 mm (MNHN 1994-747) and 1 paratype, female 121 mm (ZMUC-P.771157), same data as holotype. — Stn CP 199, 18°50'S, 163°14.5'E, 600 m depth, beam trawl, 20 September 1985: 1 paratype, female 143 mm (MNHN 1994-748). — Stn CP 242, 22°5.8'S, 167°10.3'E, 500-550 m depth, beam trawl, 3 October 1985: 10 paratypes, 9 females and 1 male, 102-137 mm (MNHN 1994-749) and 1 paratype, male 132 mm (ZMUC-P.771158).

TABLE 4. — Meristic and morphometric characters of *Neobythites neocaledoniensis* sp. nov.

|   | Holotype<br>MNHN 1994-741 | Holotype<br>+ 7 paratypes |
|---|---------------------------|---------------------------|
| Standard length                         | 169 mm                    | 124-245 mm                |
| MERISTIC CHARACTERS                     |                           | Minimum-Maximum           |
| Dorsal fin                              | 106                       | 102-106                   |
| Caudal fin                              | 8                         | 8                         |
| Anal fin                                | 89                        | 87-90                     |
| Pectoral fin                            | 28                        | 24-28                     |
| Pseudobranchial filaments               | 4                         | 3-4 (7)                   |
| Precaudal vertebrae                     | 13                        | 13                        |
| Total vertebrae                         | 59                        | 59-61                     |
| Developed rakers on anterior gill arch  | 11                        | 11                        |
| Anterior dorsal ray above vertebra n°   | 5                         | 5-6                       |
| Anterior anal ray below dorsal ray n°   | 20                        | 18-22                     |
| Anterior anal ray below vertebra n°     | 15                        | 14-16                     |
| MORPHOMETRIC CHARACTERS                 |                           |                           |
| In % of SL                              |                           |                           |
| Head length                             | 25.0                      | 22.5-25.0                 |
| Depth at anus                           | 17.0                      | 16.0-18.0                 |
| Upper jaw                               | 12.5                      | 11.5-12.5                 |
| Horizontal eye window                   | 4.7                       | 4.1-4.7                   |
| Preanal                                 | 42.5                      | 39.5-47.0                 |
| Predorsal 26.5                          | 25.0-26.5                 |                           |
| In % of head-length                     |                           |                           |
| Longest gill filaments on anterior arch | 7.6                       | 5.8-7.6                   |

DIAGNOSIS. — *N. pallidus* differs from all other *Neobythites* species by the following combination of characters : Number of dorsal fin-rays 97-101, anal 82-86, two spines on hind margin of preoperculum, 14-16 long rakers on anterior gill arch, 4-6 pseudobranchial filaments, longest gill filaments on anterior arch 2.8-4.8 % head length, no ocelli, dark blotches or vertical bands on body.

FIG. 15a. — *Neobythites pallidus* sp. nov., holotype, male 135 mm (MNHN 1994-745).

TABLE 5. — Meristic and morphometric characters of *Neobythites pallidus* sp. nov.

|   | Holotype<br>MNHN<br>1994-745 | Holotype<br>and 16<br>paratypes |         |         |      |
|---|------------------------------|---------------------------------|---------|---------|------|
| Standard length                         | 135 mm                       | 102-143 mm                      |         |         |      |
| MERISTIC CHARACTERS                     |                              | Minimum                         | (Mean)  | Maximum | (N)  |
| Dorsal fin                              | 100                          | 97                              | (100.0) | 101     | (17) |
| Anal fin                                | 85                           | 82                              | (84.9)  | 86      | (16) |
| Pectoral fin                            | 28                           | 26                              | (27.7)  | 29      | (12) |
| Pseudobr. filaments                     | 4                            | 4                               | (4.5)   | 6       | (16) |
| Precaudal vertebrae                     | 13                           |                                 | 13      |         | (17) |
| Total vertebrae                         | 59                           | 58                              | (58.9)  | 60      | (16) |
| Developed rakers on anterior gill arch  | 15                           | 14                              | (15.0)  | 16      | (16) |
| Anterior dorsal ray above vertebra n°   | 5                            | 5                               | (5.9)   | 6       | (17) |
| Anterior anal ray below dorsal ray n°   | 19                           | 18                              | (19.2)  | 20      | (17) |
| Anterior anal ray below vertebra n°     | 15                           | 15                              | (15.1)  | 16      | (17) |
| MORPHOMETRIC CHARACTERS                 |                              |                                 |         |         |      |
| In % of SL                              |                              |                                 |         |         |      |
| Head length                             | 20.5                         | 20.5                            | (21.4)  | 22.5    | (17) |
| Depth at anus                           | 14.5                         | 14.0                            | (15.3)  | 16.5    | (17) |
| Upper jaw                               | 9.3                          | 9.3                             | (10.3)  | 11.0    | (17) |
| Horizontal eye window                   | 5.0                          | 4.3                             | (4.9)   | 5.5     | (15) |
| Preanal                                 | 38.5                         | 38.0                            | (39.3)  | 42.5    | (17) |
| Predorsal                               | 24.0                         | 23.0                            | (24.8)  | 26.5    | (17) |
| In % of head-length                     |                              |                                 |         |         |      |
| Longest gill filaments on anterior arch | 3.2                          | 2.8                             | (3.6)   | 4.8     | (17) |

DESCRIPTION. — The main meristic and morphometric characters are shown in Table 5. Holotype (Fig. 15a): Snout blunt, shorter than horizontal diameter of eye window. Upper jaw ends below posterior margin of eye. Lateral line indistinct. Teeth granular. Vomer triangular. Anterior gill arch with two short and four long rakers on dorsal branch, one long raker in angle and ventral branch with ten long and four short rakers. Except for a concentration of brown pigment on snout and black pigment around anus, head and body are uniformly light brown. Paratypes: The 16 paratypes vary but slightly from the holotype; some specimens with a pointed snout (Fig. 15b) and others with pigmented lips.

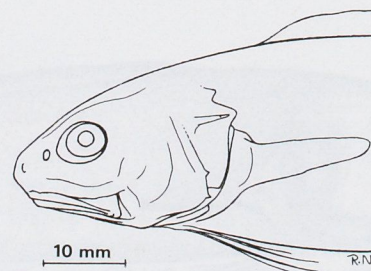


FIG. 15b. — *Neobythites pallidus* sp. nov.: paratype, female 121 mm (ZMUC-P.771157).

BIOLOGY. — A few specimens with gastropods in the intestine.

ETYMOLOGY. — The specific name refers to the pale body.

DISTRIBUTION. — Caught on four localities off New Caledonia at depths between 500 and 620 m.

REMARKS. — *N. pallidus* differs from all other *Neobythites* species with two preopercular spines and lack of distinct pigmentation, such as *N. neocaledoniensis*, *N. purus* and *N. sivicola*, by having 14-16 long rakers on anterior gill arch (cf. Remarks under *N. neocaledoniensis*).

*Neobythites unimaculatus* Smith & Radcliffe, 1913

Fig. 16

*Neobythites unimaculatus* Smith & Radcliffe in Radcliffe, 1913: 140, pl. 7, fig. 2 (type locality: 4°10'50''N, 118°39'35''E).

*Neobythites nigromaculatus* Kamohara, 1938: 67, fig. 37 (type locality: Mimase market, Japan).

*Neobythites steatiticus*: BEAUFORT & CHAPMAN, 1951: 417 (in part).

MATERIAL EXAMINED. — 3 specimens, 102-149+ mm.

**New Caledonia.** BIOCAL: stn CP 105, 21°30.71'S, 166°21.72'E, 335 m depth, beam trawl, R. V. "Jean Charcot", 8 September 1985: 2 specimens, female and male, 149+ and 115 mm (MNHN 1994-750). — Stn CP 108, 22°2.55'S, 167°5.68'E, 335 m depth, beam trawl, 9 September 1985: 1 specimen, female 102 mm (MNHN 1994-751).

DIAGNOSIS. — *N. unimaculatus* differs from all other *Neobythites* species by the following combination of characters: Distinct ocellus on dorsal fin situated immediately behind vertical line through anus, two sharp spines on posterior margin of preoperculum, ventral fins reaching halfway to anus and no vertical bars on body.

DESCRIPTION. — Number of fin-rays in dorsal 90-92, caudal 8, anal 74-75, pectoral 28-29, precaudal vertebrae 13, total vertebrae 53-54, long rakers on anterior gill arch 10, pseudobranchial filaments 4-6, anterior dorsal fin-ray above vertebra no. 5-6, anterior anal fin-ray below dorsal fin-ray no. 20 and vertebra no. 15-16. Pre-ocellus length 45-46 % standard length.

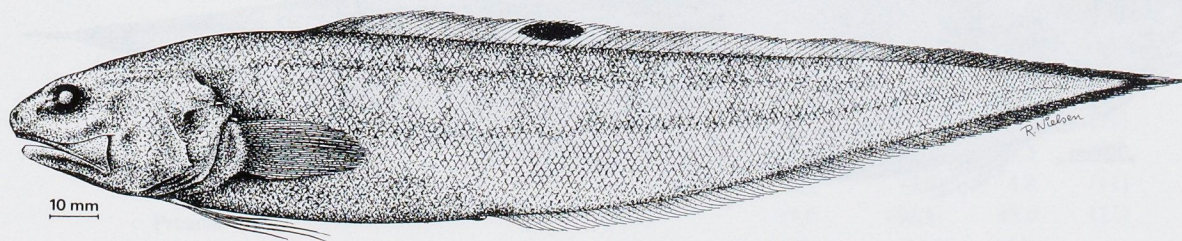


FIG. 16. — *Neobythites unimaculatus* Smith & Radcliffe, 1913, female 218 mm (BSKU 44500).

REMARKS. — The apparent main differences between *N. nigromaculatus* and *N. unimaculatus*, the number of dorsal fin-rays and lateral line scales, are caused by incorrect data in the original description of *N. unimaculatus*. Examination of the holotype gave meristic characters like those of *N. nigromaculatus*. The specimen here illustrated was caught in Japanese waters and is kept in Kyoto University (BSKU).

DISTRIBUTION. — Caught off New Caledonia at 335 m of depth. Elsewhere known from Japan to the Philippines and from the Arafura Sea at depths between 111 and 567 m.

*Neobythites zonatus* sp. nov.

Fig. 17

MATERIAL EXAMINED. — 13 specimens, 79-174 mm.

**Norfolk Ridge.** CHALCAL 2: stn CC 2, 24°55.48'S, 168°21.29'E, 500-610 m depth, otter trawl, R. V. "Coriolis", 28 October 1986: holotype, female 139 mm (MNHN 1994-752). — Stn CP 21, 24°54'S, 168°21.61'E, 500 m depth, beam trawl, 28 October 1986: 1 paratype, male 105+ mm (MNHN 1994-755). — Stn CC 1, 24°54.96'S, 168°21.91'E, 500-580 m depth, otter trawl, 28 October 1986: 2 paratypes, female + ?, 105+? and 79 mm (MNHN 1994-756).

SMIB 4: stn DW 39, 24°56.2'S, 168°21.5'E, 560 m depth, epibenthic dredge, R. V. "Alis", 7 March 1989: 1 paratype, female 108 mm (MNHN 1994-758).

BERYX 11: stn CP 7, 24°54.8'S, 168°21.3'E (Seamount "B"), 540-670 m depth, beam trawl, R. V. "Alis", 15 October 1992: 1 paratype, female 118 mm (NMNZ-P.29200) and 1 paratype, female 114 mm (ZMUC-P.771160). — Stn 22, 24°44.4'S, 168°6.6'E (Kaiyo Maru Seamount), 490-510 m depth, beam trawl, 17 October 1992: 1 paratype, male 141 mm (NMNZ-P.29019). — Stn 53, 23°48.3'S, 168°17.1'E (Jumeaux Seamount), 540-950 m depth, beam trawl, 21 October 1992: 1 paratype, male 134 mm (NMNZ-P.29329).

**New Caledonia.** MUSORSTOM 4: stn CP 238, 22°13'S, 167°14'E, 500-510 m depth, beam trawl, R. V. "Vauban", 2 October 1985: 1 paratype, female 160 mm (MNHN 1994-753).

**Chesterfield and Bellona Plateaus.** MUSORSTOM 5: stn DC 380, 19°37.7'S, 158°43.9'E, 555-570 m depth, Charcot dredge, R. V. "Coriolis", 21 October 1986: 1 paratype, female 174 mm (MNHN 1994-754).

**Loyalty Islands.** MUSORSTOM 6: stn CP 467, 21°5.13'S, 167°32.11'E, 575 m depth, beam trawl, R. V. "Alis", 21 February 1989: 1 paratype, 100 mm (MNHN 1994-757) and 1 paratype, female 128 mm (ZMUC-P.771159).

DIAGNOSIS. — *N. zonatus* differs from all other *Neobythites* species by the following combination of characters: Number of dorsal fin-rays 100-105, anal 85-91, two spines on hind margin of preoperculum, 11-13 long rakers on anterior gill arch, 3-4 pseudobranchial filaments, dorsal fin with 4-5 more or less distinct dark blotches continuing into dark, vertical bars on body, posterior part of dorsal and anal fin and caudal fin dark.

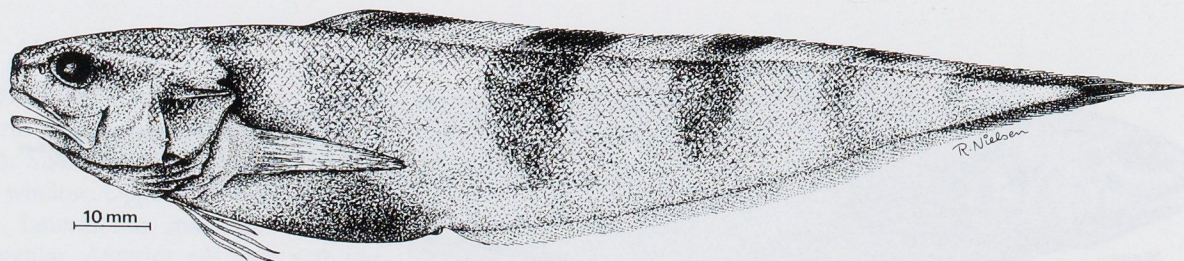


FIG. 17. — *Neobythites zonatus* sp. nov., holotype, female 139 mm (MNHN 1994-752).

DESCRIPTION. — The main meristic and morphometric characters are shown in Table 6. Holotype (Fig. 17): Snout blunt, as long as horizontal diameter of eye window. Upper jaw ends posterior to eye. Lateral line indistinct. Teeth granular. Vomer triangular with rather large teeth. Anterior gill arch with three short and three long rakers on dorsal branch, one long raker in angle and ventral branch with eight long and five short rakers. Six more or less distinct, dark-brown vertical bars on body of which four middle ones end in a dark blotch on dorsal fin, snout

darker brown with line through eyes. Paratypes: The main difference from the holotype is found in the coloration as there are specimens with up to nine diffuse vertical bars on body and five dark blotches on dorsal fin.

BIOLOGY. — Gastropods are found in the intestine of several specimens.

ETYMOLOGY. — The specific name refers to the dark, vertical bars or zones on body.

DISTRIBUTION. — Known from off New Caledonia and a few neighbouring islands at depths between 490 and 950 m.

REMARKS. — *N. zonatus* seems most closely related to *N. fasciatus* Smith & Radcliffe in Radcliffe, 1913 and *N. multistriatus* Nielsen & Quéro, 1991 with which it shares two spines on preoperculum and several dark, vertical bars on body. However, in contrast to *N. zonatus* in both the other species the bars continue as dark blotches on anal fin.

TABLE 6. — Meristic and morphometric characters of *Neobythites zonatus* sp. nov.

|   | Holotype | Holotype<br>and 12 paratypes |         |         |      |
|---|----------|------------------------------|---------|---------|------|
|   | 139 mm   | 79 -174 mm                   |         |         |      |
| MERISTIC CHARACTERS                     |          | Minimum                      | (Mean)  | Maximum | (N)  |
| Dorsal fin                              | 103      | 100                          | (102.8) | 105     | (11) |
| Caudal fin                              | 8        |                              | (8.0)   |         |      |
| Anal fin                                | 89       | 85                           | (88.9)  | 91      | (11) |
| Pectoral fin                            | 27       | 27                           | (27.4)  | 28      | (11) |
| Pseudobranchial filaments               | 4/3      | 3                            | (4.1)   | 5       | (12) |
| Precaudal vertebrae                     | 13       | 12                           | (12.9)  | 13      | (12) |
| Total vertebrae                         | 60       | 59                           | (60.2)  | 62      | (13) |
| Developed rakers on anterior gill arch  | 12       | 11                           | (12.2)  | 13      | (13) |
| Anterior dorsal ray above vertebra n°   | 5        | 5                            | (5.3)   | 6       | (13) |
| Anterior anal ray below dorsal ray n°   | 19       | 18                           | (19.0)  | 20      | (12) |
| Anterior anal ray below vertebra n°     | 15       | 14                           | (15.3)  | 17      | (12) |
| MORPHOMETRIC CHARACTERS                 |          |                              |         |         |      |
| In % of SL                              |          |                              |         |         |      |
| Head length                             | 22.5     | 21.0                         | (22.3)  | 23.5    | (11) |
| Depth at anus                           | 16.0     | 14.5                         | (16.1)  | 17.0    | (11) |
| Upper jaw                               | 11.5     | 9.9                          | (10.7)  | 11.5    | (11) |
| Horizontal eye window                   | 4.5      | 4.3                          | (4.5)   | 4.8     | (11) |
| Preanal                                 | 41.0     | 37.0                         | (40.1)  | 45.0    | (11) |
| Predorsal 26.0                          | 23.0     | (25.2)                       | 26.0    | (11)    |      |
| Length of ventral fin                   | 12.5     | 12.0                         | (14.0)  | 15.5    |      |
| Snout-1st dorsal spot                   | 28.0     | 28.0                         | (31.2)  | 34.5    |      |
| Snout-2nd dorsal spot                   | 44.0     | 43.5                         | (45.2)  | 48.5    |      |
| Snout-3rd dorsal spot                   | 61.0     | 57.5                         | (61.8)  | 67.5    |      |
| Snout-4th dorsal spot                   | 74.5     | 71.5                         | (76.1)  | 80.0    |      |
| In % of head-length                     |          |                              |         |         |      |
| Longest gill filaments on anterior arch | 5.5      | 3.8                          | (5.0)   | 7.1     | (13) |

Genus *OPHIDION* Linnaeus, 1758

Elongate body with elliptical scales arranged at oblique angles to each other, scales absent on head. Basis of ventral fins below orbit. About 150 dorsal fin-rays. Snout spine absent or weakly developed.

*Ophidion muraenolepis* (Günther, 1880)

Fig. 18

*Ophidion muraenolepis* Günther, 1880: 46, pl. XX (type locality: Kei Islands).

MATERIAL EXAMINED. — **Chesterfield and Bellona Plateaus**. MUSORSTOM 5: stn CP 311, 22°13.60'S, 159°23.90'E, 320 m depth, beam trawl, R. V. "Coriolis", 12 October 1986: 1 specimen, female 117 mm (MNHN 1994-759).

DESCRIPTION. — Number of fin-rays in dorsal 151, caudal 10, anal 111, pectoral 23, ventral 2, vertebrae 18 + 52, long rakers on anterior gill arch 4, anterior dorsal fin-ray above vertebra no. 8, anterior anal fin-ray below dorsal fin-ray no. 35 and vertebra no. 20. An almost hidden spine on operculum.

BIOLOGY. — A large foraminifera overgrown by a colony of bryozoans was found in the intestine.

DISTRIBUTION. — Known from Indo-Australian waters at depths about 300 m.

REMARKS. — The genus *Ophidion* is under a much needed revision by C. R. ROBINS, USA. Three species have been briefly described from the western Pacific and Indo-Australian areas: *O. asiro* (Jordan & Fowler, 1902), *O. genyopus* Ogilby, 1897 and *O. muraenolepis* (Günther, 1880). The present material seems closest to the latter.

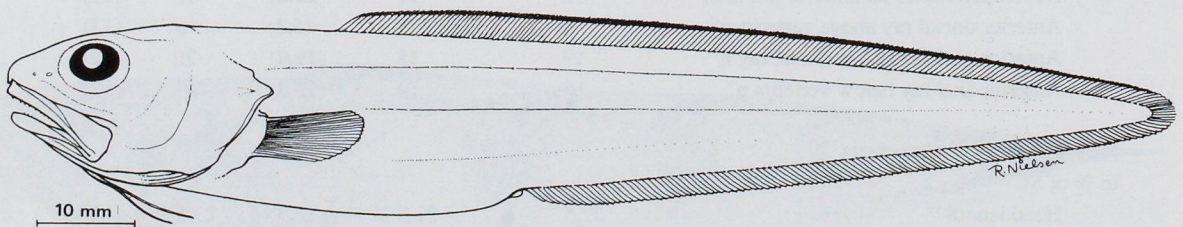


FIG. 18. — *Ophidion muraenolepis* (Günther, 1880), female 117 mm (MNHN 1994-759).

Genus *POROGADUS* Goode & Bean, 1886

Body long and slender, depth at anus at least 10 times in standard length, prominent mucous cavities below eyes, normally two rays in each ventral fin, 5-6 caudal fin-rays.



*Porogadus melampeplus* (Alcock, 1896)

Fig. 19

*Dermatorus melampeplus* Alcock, 1896: 305 (type locality: Laccadive Sea).*Porogadus melampeplus*: SHCHERBACHEV, 1980: 168.

MATERIAL EXAMINED. — 6 specimens, 112-210 mm.

**New Caledonia.** BIOCAL: stn CP 5, 21°16.49'S, 166°43.56'E, 2340 m depth, beam trawl, R. V. "Jean Charcot", 11 August 1985: 1 specimen, male 208 mm (ZMUC-P.77845). — Stn CP 27, 22°5.52'S, 166°26.41'E, 1850 m depth, beam trawl, 28 August 1985: 4 specimens, 1 male + 3?, 165-110+ mm (MNHN 1994-760).

BIOGEOCAL: stn CP 273, 21°1.53'S, 166°57.41'E, 1920-2040 m depth, beam trawl, R. V. "Coriolis", 20 April 1987: 1 specimen, female 210 mm (MNHN 1994-761).

**DESCRIPTION.** — Spines on head moderately long, number of fin-rays in dorsal c. 160, caudal 5, anal c. 140, pectoral 16, ventral 2, vertebrae 15 + 109, 18-22 long rakers on anterior gill arch, 1-2 small pseudobranchial filaments, anterior dorsal fin-ray above vertebra no. 6, anterior anal fin-ray below dorsal fin-ray no. 20 and vertebra no. 17.

**DISTRIBUTION.** — Known from east of Madagascar to New Caledonia at depths between 1500 and 2400 m.

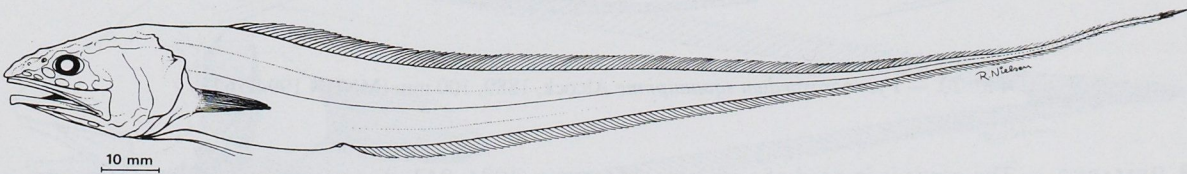


FIG. 19. — *Porogadus melampeplus* (Alcock, 1896), male 208 mm (ZMUC-P.77845).

**REMARKS.** — NYBELIN (1957: 288) and SHCHERBACHEV (1980: 164) divided the 14 species of *Porogadus* into three groups according to the development of the head spines. The present material belongs to the group with moderately developed spines holding the following species: *P. subarmatus* Vaillant, 1888, *P. melampeplus* (Alcock, 1896) and *P. guentheri* Jordan & Fowler, 1902. It seems as if the present specimens fit best into the description of *P. melampeplus*. Until a revision of the genus has taken place a specific identification of *Porogadus* specimens is rather uncertain.

Genus *PYCNOCRASPEDUM* Alcock, 1889

Relatively short body, 2-3 spines on preopercular angle, opercular spine well-developed, four long rakers on anterior gill arch, two ventral fin-rays, two median basibranchial tooth patches (additionally is found in some specimens a pair or only one unsymmetrically placed tooth patch).

*Pycnocraspedum squamipinne* Alcock, 1889

Fig. 20

*Pycnocraspedum squamipinne* Alcock, 1889: 386 (type locality: 20°17.5'N, 88°50'E).*Pycnocraspedum squamipinne*: MACHIDA, 1984: 249.

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL: stn CP 109, 22°10.03'S, 167°15.22'E, 495 m depth, beam trawl, R. V. "Jean Charcot", 9 September 1985: 1 specimen, 100 mm (MNHN 1994-762).

DESCRIPTION. — Number of fin-rays in dorsal 98, caudal 10, anal 72, pectoral 27, ventral 2, vertebrae 12 + 42, long rakers on anterior gill arch 4, pseudobranchial filaments 7, origin of dorsal fin in front of 1st vertebra, anterior anal fin-ray below dorsal fin-ray no. 27 and vertebra no. 14, sagittal otolith large. Two median basibranchial tooth patches.

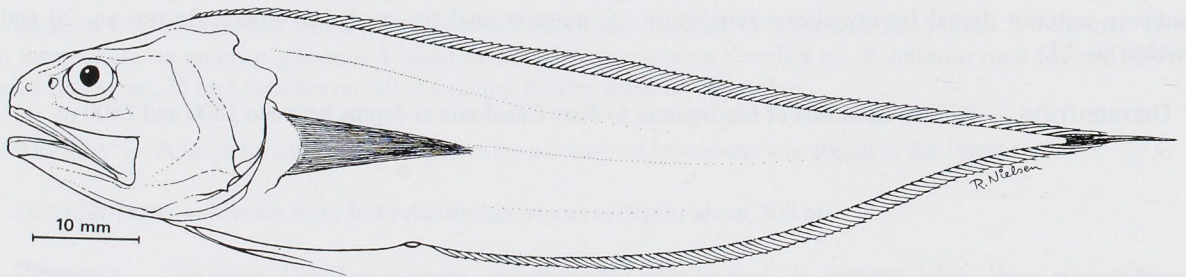


FIG. 20. — *Pycnocraspedum squamipinne* Alcock, 1889, 100 mm (MNHN 1994-762).

REMARKS. — The genus is in need of a revision. MACHIDA (1984: 247) discussed the four nominal species in connection with describing a fifth species, *P. fulvum*. He stated that his new species resembled *P. squamipinne* but differed from it by having pseudobranchial filaments, a longer snout, larger body depth, and fewer rays in dorsal and anal fins. Examination of one of Alcock's syntypes showed that *P. squamipinne* does have one pseudobranchial filament and specimens on loan here in Copenhagen show that the relative length of the snout varies with the length of the fish as does the body depth. Five *Pycnocraspedum* specimens from the western Indian Ocean all had four pseudobranchial filaments like *P. fulvum* and 88-92 dorsal and 68-71 anal fin-rays while *P. fulvum* 81 and 63 rays respectively. This indicates either that there is an undescribed species in the western Indian Ocean or that *P. squamipinne* has up to four pseudobranchial filaments. It also shows that *P. fulvum* and *P. squamipinne* are closely related. The present specimen does not fit properly with any of the Indo-Pacific species but seems closest to *P. squamipinne*.

DISTRIBUTION. — Known in a few specimens from off East Africa to New Caledonia at depths between 200 and 500 m.

Genus *TAUREDOPHIDIUM* Alcock, 1890

A monotypic genus. See description below.

*Tauredophidium hextii* Alcock, 1890

Fig. 21

*Tauredophidium hextii* Alcock, 1890: 213, pl. VIII (type locality: Bay of Bengal).*Tauredophidium hextii*: SHCHERBACHEV, 1980: 111.

MATERIAL EXAMINED. — 2 specimens, 77-81 mm.

**New Caledonia.** BIOCAL: stn CP 58, 23°56.52'S, 166°40.55'E, 2660 m depth, beam trawl, R. V. "Jean Charcot", 1 September 1985: 1 specimen, female 81 mm (MNHN 1994-763).

BIOGEOCAL: stn CP 273, 21°1.53'S, 166°57.41'E, 1920-2040 m depth, beam trawl, R. V. "Coriolis", 20 April 1987: 1 specimen, male 77 mm (MNHN 1994-764).

DESCRIPTION. — Robust head and tapering body, opercular spine very long, preoperculum with three strong spines, eyes not visible, ventral fins widely separated, one median and a pair of basibranchial tooth patches. Number of dorsal fin-rays 72-75, caudal 7-8, anal 64-65, pectoral 18-20, ventral 2, vertebrae 11 + 44-46, long rakers on anterior gill arch 11-12, pseudobranchial filaments 2, anterior dorsal fin-ray above vertebra no. 4-5, anterior anal fin-ray below dorsal fin-ray no. 13-14, and vertebra no. 13-14.

DISTRIBUTION. — Known from off East Africa to New Caledonia at depths between c. 1500 and 2660 m.

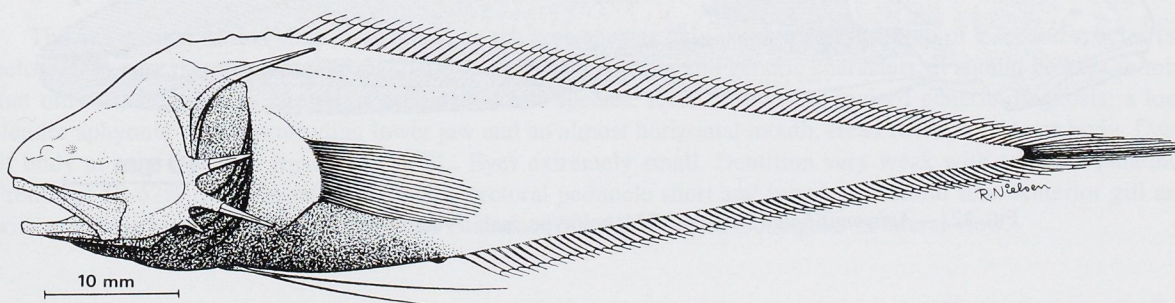


FIG. 21. — *Tauredophidium hextii* Alcock, 1890, male 77 mm (MNHN 1994-764).

## Family APHYONIDAE

Vertical fins united, scales absent, precaudal vertebrae 26-34, swimbladder absent, basibranchial tooth patches absent, opercular spine weak or absent. Viviparous.

Genus *APHYONUS* Günther, 1878

Developed gill rakers on anterior arch 3-14, palatine teeth absent, pectoral fin with 13-19 rays, ventral fin with one ray, mouth almost horizontal. Two of the four recognized species (NIELSEN, 1974) are caught in New Caledonian waters.

*Aphyonus bolini* Nielsen, 1974

Fig. 22

*Aphyonus bolini* Nielsen, 1974: 179, fig. 1 (type locality: 15°38'N, 111°54'E).

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL: stn CP 69, 23°51.38'S, 167°58.68'E, 1225 m depth, beam trawl, R. V. "Jean Charcot", 3 September 1985: 1 specimen, female 99 mm (MNHN 1994-765).

DESCRIPTION. — Eyes minute, mouth horizontal, peritoneum dark blue. Number of dorsal fin-rays 69, caudal 8, anal 54, pectoral 16, vertebrae 26 + 39, anterior dorsal fin-ray above vertebra no. 19, anterior anal fin-ray below dorsal fin-ray no. 16 and below vertebra no. 29, long gill rakers on anterior arch 13. Head 22% SL, upper jaw 11% SL, depth of body at origin of dorsal fin 13.5% SL, predorsal 38.5% SL, preventral 19% SL, preanal 54% SL.

REMARKS. — *A. bolini* is closely related to *A. brevidorsalis* Nielsen, 1969 but differs by having more long gill rakers (13-14 vs. 9), fewer precaudal vertebrae (26 vs. 32) and a more slender body (depth of body at origin of dorsal fin 13.5 vs 21.0% SL).

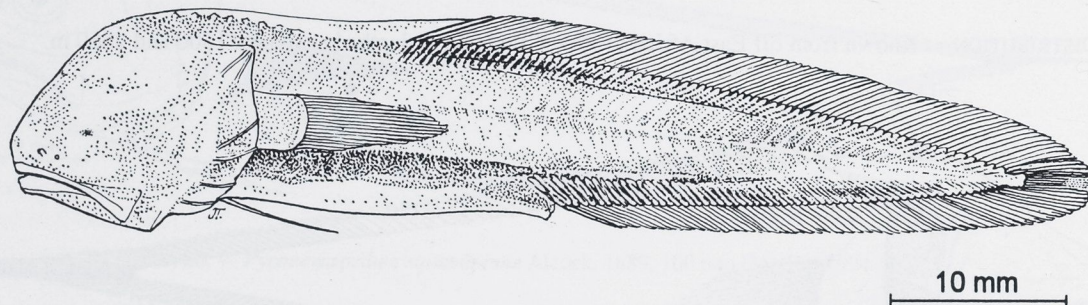


FIG. 22. — *Aphyonus bolini* Nielsen, 1974, holotype, male 59 mm (from NIELSEN, 1974).

DISTRIBUTION. — Known in a few specimens from off New Caledonia, the South China Sea and from off Madagascar (unpublished) at depths between 1075 and 1300 m.

*Aphyonus gelatinosus* Günther, 1878

Fig. 23

*Aphyonus gelatinosus* Günther, 1878: 22 (type locality: 12°8'S, 145°10'E).

*Aphyonus gelatinosus*: NIELSEN, 1969: 15, fig. 1.

MATERIAL EXAMINED. — **New Caledonia**. BIOCAL: stn CP 69, 23°51.38'S, 167°58.68'E, 1225 m depth, beam trawl, R. V. "Jean Charcot", 3 September 1985: 1 specimen, female 121 mm (MNHN 1994-766).

DESCRIPTION. — Eyes not visible, mouth horizontal, peritoneum dark blue. Number of dorsal fin-rays 104, caudal 8, anal 65, pectoral 18, vertebrae 29 + 52, anterior dorsal fin-ray above vertebra no. 7, anterior anal fin-ray below dorsal fin-ray no. 37 and below vertebra no. 34, developed gill rakers on anterior arch 3. Head 25% SL, upper jaw 12.5% SL, depth of body at origin of dorsal fin 19% SL, predorsal 28.5% SL, preventral 20.5% SL, preanal 54% SL.

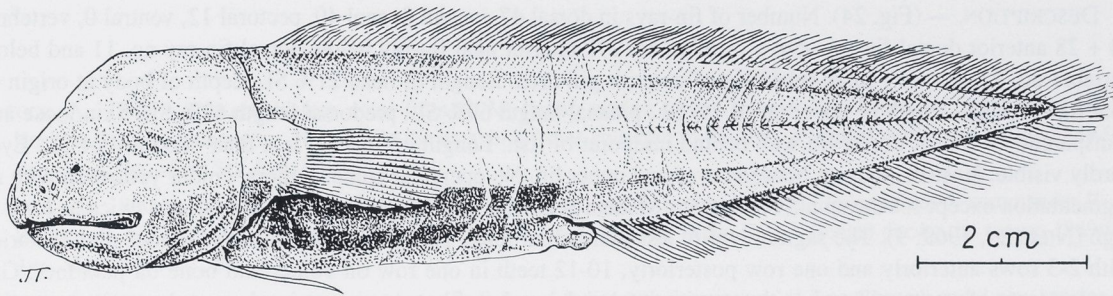


FIG. 23. — *Aphyonus gelatinosus* Günther, 1878, male 121 mm, (from NIELSEN, 1969).

REMARKS. — *A. gelatinosus* differs from all other *Aphyonus* species by having more dorsal fin-rays (93-116 vs. 69-75), more caudal vertebrae (50-53 vs. 38-40) and a shorter predorsal length (ca. 30% SL vs. ca. 40% SL).

DISTRIBUTION. — Known from a number of specimens from all oceans except for the East Pacific at depths between 900 and 2560 m.

#### Genus *PARASCIADONUS* Nielsen, 1984

The description of this genus was based on the type species only. With the description of a second species (see below) it is now possible to make an attempt to separate specific and generic characters. It should be kept in mind that only the holotype is known of each of the two species. Here follows the revised generic diagnosis: a long, slender aphyonid with a protruding lower jaw and an almost horizontal mouth. Head twice as wide as body. Depth of body at origin of anal fin about 7% SL. Eyes extremely small. Dentition very weak with edentate palatines. Predorsal 50-62% SL, preanal 69-72% SL, pectoral peduncle short and broad, no ventral fins. Anterior gill arch with minute tubercles and very small or no filaments. Vertebral centra rectangular in lateral view.

#### *Parasciadonus pauciradiatus* sp. nov.

Fig. 24

MATERIAL EXAMINED. — New Caledonia. BIOCAL: stn DS 14, 20°18.09'S, 167°17.7'E, 3680-3700 m depth, epipelagic dredge, R. V. "Jean Charcot", 13 August 1985: holotype, female 46 mm (MNHN 1994-767).

DIAGNOSIS AND RELATIONSHIP. — *P. pauciradiatus* differs from the Atlantic *P. brevibrachium*, the only other known species of *Parasciadonus*, in the following characters with *P. brevibrachium* in brackets: Number of dorsal fin-rays 46(72), anal 40(48), pectoral 12(20), precaudal vertebrae 34(50), anterior anal fin-ray below dorsal fin-ray no. 11(33) and below vertebra no. 32(52), no skin flaps along lateral line (12-19 skin flaps).

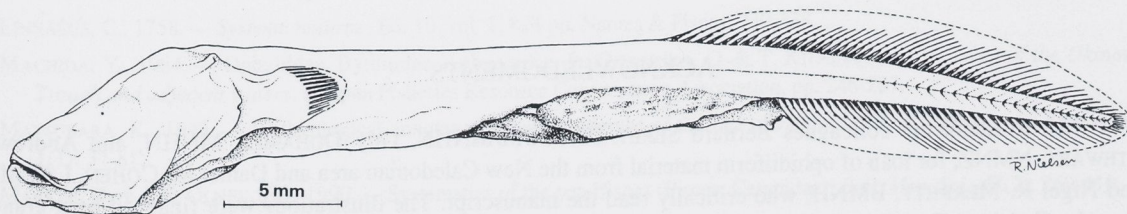


FIG. 24. — *Parasciadonus pauciradiatus* sp. nov., holotype, female 46 mm (MNHN 1994-767).

DESCRIPTION. — (Fig. 24). Number of fin-rays in dorsal 47, caudal 8, anal 40, pectoral 12, ventral 0, vertebrae 34 + 28 anterior dorsal fin-ray above vertebra no. 27, anterior anal fin-ray below dorsal fin-ray no. 11 and below vertebra no. 32, ten very small tubercles on anterior gill arch. Length of head 21% SL, depth of body at origin of anal fin 7.2% SL, length of upper jaw 9.1% SL, preanal length 69% SL, predorsal length 62% SL. Skin loose and transparent. Origin of dorsal fin well behind midpoint of fish. Length of anal fin less than one third of SL. Eyes hardly visible. Nostrils midway between eyes and upper lip. No opercular spine. General colour yellowish with no pigmentation except for the small, black eyes. Median segments of muscoli infracarinal mediales twice as long as high (NIELSEN, 1969: 9). The sagittal otolith less than 1 mm long. Teeth very small. Premaxillaries and dentaries with 2-3 rows anteriorly and one row posteriorly, 10-12 teeth in one row on vomer and none on palatines. Gill opening large. Anterior gill arch with ten minute tubercles and no filaments; posterior three arches with somewhat larger tubercles and small filaments. Axial skeleton well ossified (judging from radiographs). Neural spine on anterior vertebra as long as the following spines. Only the three posterior precaudal vertebrae with parapophyses. Apparently no ribs. Centrum of posterior precaudal vertebra about 1.5 times as high as long. Ovaries extended and seem to hold about 25 fertilized eggs with a diameter of 1-1.5 mm. No fleshy appendages developed near genital opening.

DISTRIBUTION. — Only known from the holotype off New Caledonia caught in an epibenthic dredge at 3680-3700 m.

ETYMOLOGY. — The specific name, *pauciradiata*, refers to the relatively few fin-rays when compared to the type species.

#### REMARKS ON DISTRIBUTION

Even though it seems a little premature to comment on distributional relationship when the ophidiiform deep-sea fauna off New Caledonia is so relatively poorly known (24 species represented by 149 specimens), some notes may give useful information. Seven species seem to be endemic to the area sampled. Six of these belong to the bathyal genus *Neobythites* caught at depths of between 275 and 670 m in numbers of 2-17 specimens each. Their absence in the many trawl hauls undertaken at these depths all over the Indo-Australian region suggests that these six species are true endemics. The seventh endemic, *Parasciadonus pauciradiatus* known from the holotype only, was caught at a depth of 3680-3700 m. Fish from these depths generally have a wide distribution and considering how seldom these abyssal depths are fished it may well be that additional specimens will invalidate endemism for this species.

Two species, *Acanthonus armatus* and *A. gelatinosus*, are cosmopolitans known from c. 1000-4000 m of depth. Of the remaining 15 species 1-2, *Bathyonus caudalis* and *Dicrolene longimana* (?), are known from the entire Indo-Pacific region and 1-2, *Pyramodon ventralis* and *Bassozetus glutinosus* (?), have an Indo-West Pacific distribution. Of the final 11 species, six are known only from the Indo-Australian region, five extend to the Indian Ocean also, and two extend also to Japan. Based on the present material the New Caledonian ophidiiform fauna seems to have much more relation to the Indian Ocean and the Indo-Australian region than to the Pacific region.

#### ACKNOWLEDGMENTS

I wish to thank my colleagues Bernard SÉRET, ORSTOM/MNHN, Guy DUHAMEL, MNHN, and Andrew STEWART, NMNZ, for loan of ophidiiform material from the New Caledonian area and Daniel M. COHEN, LACM, and Nigel R. MERRETT, BMNH, who critically read the manuscript. The illustrations were financed by a grant from the Carlsberg Foundation.

## REFERENCES

- ALCOCK, A., 1889. — Natural history notes from H. M. Indian marine survey steamer "Investigator", commander R. F. Hoskyn, R. N., commanding. No. 13. On the bathybial fishes collected in the Bay of Bengal during the season 1889-90. *Ann. Mag. Nat. Hist.*, Ser. 6, 4: 376-399.
- ALCOCK, A., 1890. — Natural history notes from H. M. Indian marine survey steamer "Investigator", commander R. F. Hoskyn, R. N., commanding. No. 16. On the bathybial fishes collected in the Bay of Bengal during the season 1889-90. *Ann. Mag. Nat. Hist.*, Ser. 6, 6: 197-222.
- ALCOCK, A., 1896. — A supplementary list of marine fishes of India, with descriptions of 2 new genera and 8 new species. *J. Asiatic Soc. Bengal*, 65, ii(3): 301-338.
- COHEN, D. M. & J. G. NIELSEN, 1978. — Guide to the identification of genera of the fish order Ophidiiformes with a tentative classification of the order. *NOAA Technical Report NMFS Circular*, 417: 1-72.
- DE BEAUFORT, L. F. & W. M. CHAPMAN, 1951. — *The fishes of the Indo-Australian archipelago IX. Percomorphi (concluded), Blennioidea*. E.J. Brill, Leiden, 484 pp.
- FOURMANOIR, P. & J. RIVATON, 1979. — Poissons de la pente récifale externe de Nouvelle-Calédonie et des Nouvelles-Hébrides. *Cah. Indo-Pacifique*, 1(4): 405-443.
- GARMAN, S., 1899. — Reports on an exploration off the west coasts of Mexico, Central and South America, and off the Galapagos Islands, in charge of Alexander Agassiz, by the U. S. Fish commission steamer "Albatross", during 1891. XXVI. The fishes. *Mem. Mus. Comp. Zool. Harvard Coll.*, 24: 1-431.
- GILBERT, C. H., 1890. — Preliminary report on the fishes collected by the steamer Albatross on the Pacific coast of North America during the year 1889, with descriptions of twelve new genera and ninety-two new species. *Proc. U.S. Natl. Mus.*, 13: 49-126.
- GILL, T. N., 1884. — Diagnosis of new genera and species of deep-sea fish-like vertebrates. *Proc. U.S. Natl. Mus.*, 6: 253-260.
- GOODE, G. B. & T. H. BEAN, 1883. — Reports on the results of dredging under the supervision of Alexander Agassiz, on the east coast of the United States, during the summer of 1880, by the U. S. coast survey steamer "Blake", commander J. R. Bartlett, U. S. N., commanding. *Bull. Mus. Comp. Zool.*, 10(5): 183-226.
- GOODE, G. B. & T. H. BEAN, 1885. — Descriptions of new fishes obtained by the United States fish commission mainly from deep water off the Atlantic and Gulf coasts. *Proc. U.S. Natl. Mus.*, 8: 589-605.
- GOODE, G. B. & T. H. BEAN, 1896. — Oceanic Ichthyology. *U.S. Natl. Mus. Spec. Bull.*, 2: 1-553.
- GÜNTHER, A., 1878. — Preliminary notices of deep-sea fishes collected during the voyage of H. M. S. "Challenger". *Ann. Mag. Nat. Hist.*, Ser. 5, 2: 17-28.
- GÜNTHER, A., 1880. — Report on the shore fishes procured during the voyage of H. M. S. "Challenger" in the years 1873-76. *Challenger Rep., Zool.*, Ser. 5, 1(6): 1-82.
- GÜNTHER, A., 1887. — Report on the deep-sea fishes collected by H. M. S. "Challenger" during the years 1873-76. *Challenger Rep., Zool.*, Ser. 5, 22(57): lxx + 1-268.
- HUBBS, C. L. & K. F. LAGLER, 1958. — Fishes of the Great Lakes region. *Cranbrook Inst. Sci. Bull.*, 26: 1-431.
- JORDAN, D. S. & H. W. FOWLER, 1902. — A review of the ophidioid fishes of Japan. *Proc. U.S. Natl. Mus.*, 25: 743-766.
- JORDAN, D. S. & J. O. SNYDER, 1901. — List of fishes collected in 1883 and 1885 by Pierre Louis Jouy and preserved in the United States National Museum, with description of six new species. *Proc. U.S. Natl. Mus.*, 23: 739-769.
- KAMOYARA, T., 1938. — *On the offshore bottom-fishes of Prov. Tosa, Shokoku, Japan*. Maruzen, Tokyo, 86 pp.
- LINNAEUS, C., 1758. — *Systema naturae*. Ed. 10, vol. 1, 824 pp. Nantes & Pisces: 230-338.
- MACHIDA, Y., 1984. — Ophidiidae. Bythitidae. Aphyonidae. In: OKAMURA, O. & T. KITAJIMA (eds.): *Fishes of the Okinawa Trough and adjacent waters*. I. Japan Fisheries Resource Conservation Association, pp. 246-267.
- MATSUBARA, K., 1943. — Ichthyological annotations from the depths of the Sea of Japan, I-VII. *J. Sigenkagaku Kenkyusyo*, 1(1): 37-81.
- MARKLE, D. & J. E. OLNEY, J.E., 1990. — Systematics of the pearlfishes (Pisces: Carapidae). *Bull. Mar. Sci.*, 47(2): 269-410.

- NALBANT, T. T. & R. F. MAYER, 1971. — New and rare species of fishes from the Peru-Chile Trench, collected during the 11th cruise of R. V. "Anton Bruun" (1965). *Rev. Roum. Biol.- Zool.*, **16**(5): 315-324.
- NIELSEN, J. G., 1969. — Systematics and biology of the Aphyonidae (Pisces, Ophidioidea). *Galathea Rep.*, **10**: 7-90.
- NIELSEN, J. G., 1974. — *Aphyonus bolini*, a new deep sea fish from the South China Sea (Pisces, Ophidioidei, Aphyonidae). *Steenstrupia*, **3**(16): 179-182.
- NIELSEN, J. G., 1984. — *Parasciadonus brevibrachium* n. gen. et sp.- An abyssal aphyonid from the Central Atlantic (Pisces, Ophidiiformes). *Cybium*, **8**(1): 39-44.
- NIELSEN, J. G., 1995 — A review of the species of the genus *Neobythites* (Pisces: Ophidiidae) from the western Indian Ocean with descriptions of seven new species. *Ichthyol. Bull. J. L. B. Smith Inst. Ichthyol.*, **62**: 1-12.
- NIELSEN, J. G. & J.- C. HUREAU, 1980. — Revision of the ophidiid genus *Spectrunculus* Jordan & Thompson, 1914, a senior synonym of *Parabassogigas* Nybelin, 1957 (Pisces, Ophidiiformes). *Steenstrupia*, **6**(11): 149-169.
- NIELSEN, J. G. & J.- C. QUÉRO, 1991. — Quelques Ophidiiformes de l'île de la Réunion: description d'une espèce nouvelle. *Cybium*, **15**: 193-198.
- NYBELIN, O., 1957. — Deep-sea bottom-fishes. *Rep. Swed. deep Sea Exped.*, **2** (Zool. No. 20): 247-345.
- OGILBY, J. D., 1897. — New genera and species of Australian fishes. *Proc. Linn. Soc. N.S.W.*, **22**: 62-95.
- RADCLIFFE, L., 1913. — Descriptions of seven new genera and thirty-one new species of fishes of the families Brotulidae and Carapidae from the Philippine Islands and the Dutch East Indies. *Proc. U. S. Natl. Mus.*, **44**: 135-176.
- SHCHERBACHEV, Y. N., 1980. — A preliminary review of the deep-sea ophidiids (Ophidiidae, Ophidiiformes) of the Indian Ocean. *Trudy Inst. Okeanol.*, **110**: 105-176 (in Russian).
- VAILLANT, L., 1888. — Poissons. In: *Expéditions scientifiques du « Travailleur » et du « Talisman » pendant les années 1880, 1881, 1882, 1883*. G. Masson, Paris, 406 pp.