

Two New Species of *Coelorinchus* (Teleostei, Gadiformes, Macrouridae) from the Tasman Sea

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Two new deepwater *Coelorinchus* species were captured during a joint Australia/New Zealand marine fauna survey of the West Norfolk and South Norfolk Ridges and south Lord Howe Rise in May–June 2003. *Coelorinchus osipullus* sp. nov. is similar to the Australasian *C. celaenostomus* McMillan and Paulin and had been mistakenly identified as such in collections made by French surveys off New Caledonia and the Loyalty Islands, but the new species has pale to dusky lips and mouth compared to the intense black markings of *C. celaenostomus*. It is also very similar to *C. sheni* Chiou, Shao, and Iwamoto from Taiwan, but has a shorter and narrower snout and blackish gums compared to the pale gums of *C. sheni*. *Coelorinchus obscuratus* sp. nov. is most similar to *C. occa* (Goode and Bean) from the western North Atlantic, but the latter has a larger orbit, lacks a blackish orbital rim, and has much more coarsely spinulated scales.

The ridges and seamounts in and around the Tasman Sea between New Zealand and the islands of New Caledonia and the Loyalty Islands have been little explored by vessels sampling the bottom with their collecting gear. The demersal fishes from the area are poorly represented in museum collections, and consequently the fauna is not well known. French research vessels conducted several biodiversity surveys in the Exclusive Economic Zones (EEZ) of New Caledonia, Vanuatu, and the Loyalties from 1984 to the late 1990s (see Richer de Forges 1990 and 1993 for more information on these cruises). The Norfolk Ridge south of New Caledonia was surveyed during the 1991 BERYX 2 cruise and the 1996 HALIPRO 2 cruise, which also surveyed the Loyalty Ridge. During both these cruises, specimens of *Coelorinchus osipullus* sp. nov. were collected but were misidentified as *C. celaenostomus* McMillan and Paulin, 1993 in publications by Iwamoto and Merrett (1997) and Merrett and Iwamoto (2000). From 11 May to 5 June 2003, the south ends of the Norfolk Ridge and Lord Howe Rise and the West Norfolk ridge were sampled during a biodiversity survey (NORFANZ) funded by New Zealand and Australia (Clark and Roberts 2008). During this cruise a variety of trawls and nets was deployed from the National Institute of Water and Atmospheric Research (NIWA) vessel *Tangaroa*. The fishes were mostly caught using a high-opening bottom trawl that lacked wings, or a full-wing trawl, although some were taken using an epibenthic sled and a beam trawl. Continental, insular, and seamount slope depths down to about 1789 m were sampled.

This report describes two new grenadiers (family Macrouridae) of the genus *Coelorinchus*. The genus is well represented in the Australasian region with about 21 species known from New Zealand (unpublished data), about 35 from Australia (Iwamoto and Williams 1999; Iwamoto and Graham 2001, 2008), and 17 from the New Caledonian region (Merrett and Iwamoto 2000). Sev-

eral species are confined to either New Zealand or Australia and some have restricted distributions around those countries, so it is not surprising to encounter apparently new species during a survey of a previously poorly sampled region. It is planned to deal with the other macrourids and the family Bathygadidae from the NORFANZ cruise in separate publications.

MATERIALS AND METHODS

Our study specimens are deposited in AMS, BMNH, CAS, CSIRO, MNHN, NMNZ, and NMV. The reader is referred to Eschmeyer's (1998) *Catalog of Fishes* for institutional abbreviations and for detailed references and authorities to taxonomic names used. Methods for taking counts and making measurements follow procedures of Gilbert and Hubbs (1916), slightly modified by Iwamoto (1970) and Iwamoto and Sazonov (1988).

Genus *Coelorinchus* Giorna, 1809

[N.B. See Iwamoto (1990) for diagnosis of genus and key to species of the world. The reason for the spelling change back to the use of the diphthong *oe* is discussed by Iwamoto (2008: xi)]

Coelorinchus osipullus sp. nov.

Figures 1–3.

Coelorinchus celaenostomus (non McMillan and Paulin 1993): Iwamoto and Merrett 1997: 490–493, fig. 7 (4 specimens, 224–520 mm TL; Norfolk Ridge; 600–1340 m). Merrett and Iwamoto 2000: 743–744 (9 specimens [including three reported by Iwamoto and Merrett 1997], 310–710 mm TL, Norfolk and Loyalty ridges; 643–1340 m).

Coelorinchus sp. 1: Clark and Roberts 2008:51, App. 4, color plate.

DIAGNOSIS.— A species of *Coelorinchus* lacking external evidence of a light organ, anus immediately before origin of anal fin; snout long, about 2.5 into head length, anterolateral margins not completely supported by bone. Premaxillary teeth in a long band, the outer series only slightly enlarged. Underside of head fully scaled with small scales armed with discrete uniform rows of small spinules. Mouth with black gums. Prominent body markings, with 10 or 11 wide dark bars or saddles, most of which do not extend much below lateral midline; bands interrupted by narrow white (or pale) spaces oriented vertically or at slightly oblique angles; anal fin with broad dark distal margins, the anterior portion of fin with distal tips white.

TYPE SPECIMENS.— (11 specimens, all except MNHN 1996-363 collected by the R/V Tangaroa).— Holotype: MNHN 1998-237 (172 mm HL, 555+ mm TL); Loyalty Ridge, 23°31.15'S, 169°36.64'E, 685–831 m; HALIPRO 2, stn. BT 3; 6 Nov. 1996. Paratypes: **Norfolk Ridge:** MNHN 1996-363 (ex. NMNZ P.27431) (57.9 HL, 224 TL); 24°53.0'S, 168°22.3'E, 600–650 m; BERYX 2, stn. 2, R/V Alis; 24 Oct. 1991. CAS 90982 (143 HL, 520 TL) and MNHN 1998-322 (not measured); 25°19.93'S, 168°56.56'E, 697–1340 m; HALIPRO 2, stn. BT 32; 12 Nov. 1996. NMNZ P.40991 (ex. CAS 90670)(116 HL, 320 TL) and BMNH 1997.5.21:35 (149 HL, 515+ TL); 25°23.03'S, 168°56.47'E, 643–1233 m; HALIPRO 2, stn. BT 34; 12 Nov. 1996. MNHN 1998-235 (175 HL, 627 TL), CAS 90984 (116 HL, 310 TL), and BMNH 1997.5.21:39 (127 HL, 410+ TL); 25°23.00'S, 168°56.99'E, 640–740 m; HALIPRO 2, stn. BT 35; 12 Nov. 1996. BMNH 1997.5.21:63 (188 HL, 710 TL); 23°13.86'S, 167°57.19'E, 650–660 m; HALIPRO 2, stn. BT 91; 23 Nov. 1996. CSIRO H6005-04 (177 HL, 646 TL); 29°53.11'S, 167°49.04'E, 650–666 m; TAN0308, NORFANZ stn. 17; 14 May 2003.

COUNTS AND MEASUREMENTS (holotype in boldface, followed by range in paratypes).— 1D. **II,9**, II,8–9; P. **i16**, i17–i19; V. **7**, 7; inner GR-I **2+7**, (2–3) + 6, GR-II (outer/inner) **0+8**, 0+6 / **2+7**, (1–2) + 7; scales below 1D. **6.5**, 6–6.5, below mid-base 1D. **4.5**, 4.5–6; below 2D. **5.5**, 5.5–6.5; over distance equal to predorsal length **36**, 36–43; pyloric caeca 41–56 (2 paratypes).

Total length **555+** (**large pseudocaudal**), 224–710 mm; HL **172**, 58–188 mm; preanal length

250, 77–264 mm. The following in percent of HL: snout length **42**, 39–41; preoral length **31**, 23–31; internasal width **19**, 16–20; interorbital width **25**, 21–24; orbit diam. **20**, 21–25; suborbital width **15**, 13–15; postorbital length **39**, 35–39; distance orbit to preopercle angle **43**, 38–44; upper jaw length **31**, 27–33; length barbel **6**, 8–13; length outer gill slit **17**, 16–17; body depth **58**, 53–62; interspace between 1D. and 2D. **20**, 18–22; height 1D. **44**, 45–50; length base 1D. **19**, 16–19; length P. **45**, 39–46; length outer V ray **28**, 30–45.

DESCRIPTION.— Body relatively shallow, greatest depth under origin of first dorsal fin about 1.6–1.9 into HL. Head large, length about 2.6–3.9 times into total length; broadly cone-shaped, greatest width about equal to greatest depth above angle of lower jaw; least width across interorbital space less than or about equal to orbit diameter, greater than least width across internasal ridges. Snout moderately long, about equal to postorbital length, slender, pointed in lateral and dorsal views, sides viewed from above converge in gentle uniform curves to a narrowly rounded tip that lacks a sharp, stout, well-defined terminal scute. Narrow, sharply defined clefts running on both sides of median series of scales. Ventral profile of snout similarly gently curved, its ventral (preoral) length much shorter than snout length. Anterolateral margins of snout incompletely supported by bone or heavy scute-like scales. Mouth large, jaws relatively unrestricted by lip folds, anterior edge of lips slightly forward of vertical through anterior edge of nasal fossa; posterior margin of maxilla more or less below posterior one-third to one-fourth of orbit. Lips thick and papillose. Chin barbel slender, well developed, its length 0.3–0.6 of orbit. Greatest orbit diameter about 1.6–2.1 into snout length, 4.0–5.1 into HL, about 1.5–2.1 times into distance orbit to angle of preopercle. Exposed portions of combined opercle and subopercle bones narrow and deep, posteroventral tip of subopercle terminates in a narrow tip. Preopercle large, broad, with posteroventral end extended into a long, relatively narrow lobe. Suborbital region relatively flat, with suborbital ridge low but forming a broad shelf, the depth of which exceeds half that of the suborbital width. Angle formed (in cross-section) by suborbital sharp but very obtuse.

Teeth in both jaws all small, conical, in a relatively broad tapered band in upper jaw, with an outer series of very slightly larger teeth; band in lower jaw 1–4 teeth wide, tapering to a single row posteriorly, and extending more than three-fourths length of rictus.

Origins of pectoral and pelvic fins about on same vertical, origin of first dorsal fin slightly behind that vertical. Fins except most rays of second dorsal fin well developed. First dorsal fin lacking any prolonged rays; its height greater than snout length and about equal to distance orbit to preopercle; its base about equal to or shorter than interspace between first and second dorsal fins. Pectoral fin length slightly less than height of first dorsal, its tip extending posteriorly to vertical through origin of anal fin. Pelvic fin with outer ray slightly prolonged into a hair-fine tip that barely extends to, or falls short of, anal fin origin. Anal fin well developed, long based, extending to end of tail where it is confluent with second dorsal fin. Second dorsal fin low over almost entire length, its longest anterior rays scarcely longer than vertical diameter of posterior nostril.

Scales large, adherent, covered with discrete divergent rows of short, narrow, overlapping spinules that form sharp serrated crest-like ridges; none of the spinule rows enlarged. Scales below interspace of first and second dorsal fins with 5–7 divergent rows of spinules. Head scales highly variable in size and nature of spinulation; many on operculum (to suborbital ridge) large with widely divergent spinule rows. Scales of suborbital ridge stout, coarsely modified, in two rows, well defined from anterolateral angle of snout posteriorly to near end of preopercle; scales above large modified scales in about 3 rows. Nasal fossa almost fully covered with small scales having 1–3 spinule rows. Underside of snout and lower jaw rami fully scaled; each small scale with 1–3 short rows of low spinules.

No external sign of light organ.

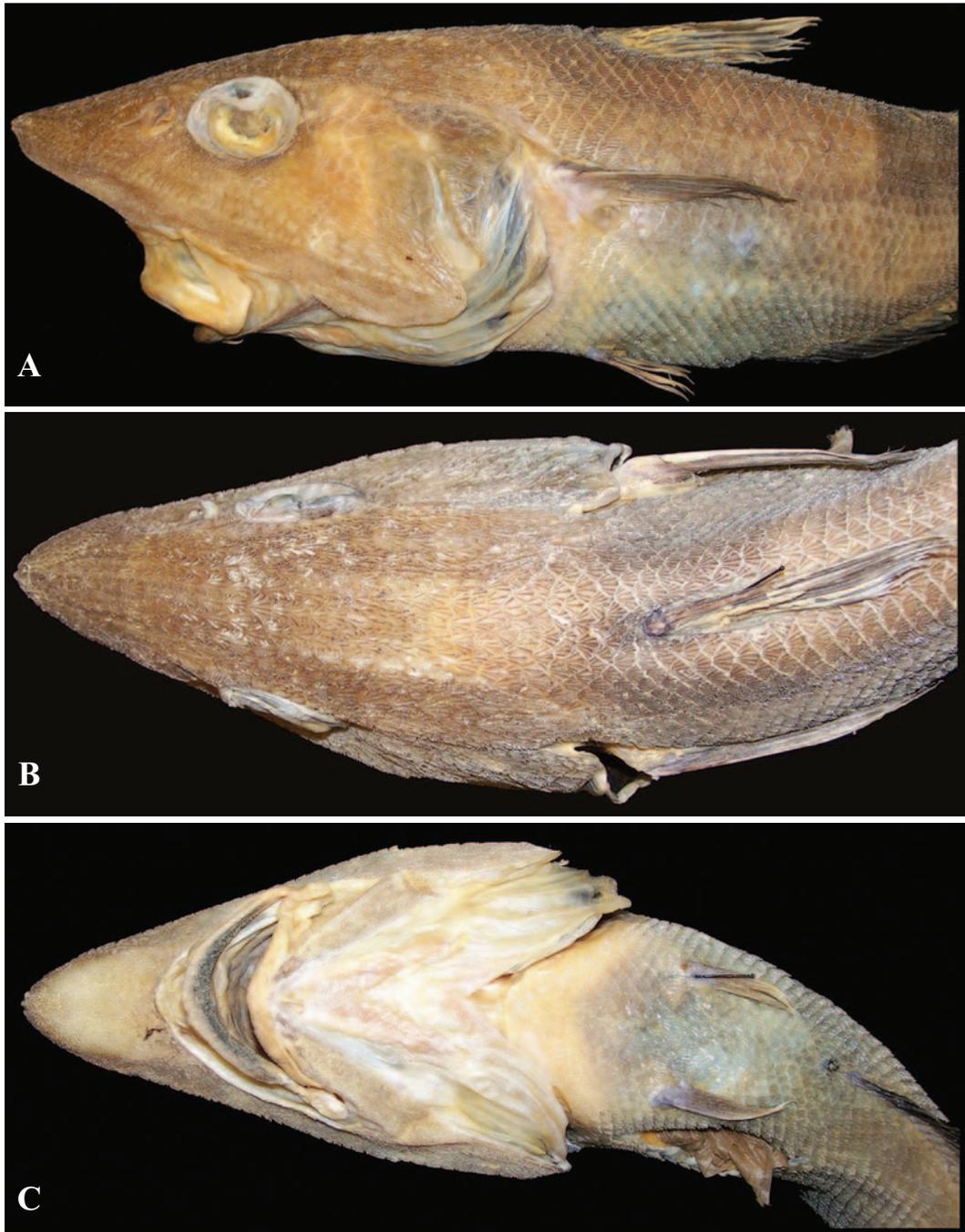


FIGURE 1. *Coelorinchus osipullus* sp. nov. Holotype, MNHN 1998-237 (172 mm HL, 555+ mm TL); Loyalty Ridge, 23°31.15'S, 169°36.64'E, 685-831 m; HALIPRO-II stn. BT 03; 6 Nov. 1996. (A) Lateral view; (B) dorsal view of head; (C) ventral view of head and trunk.

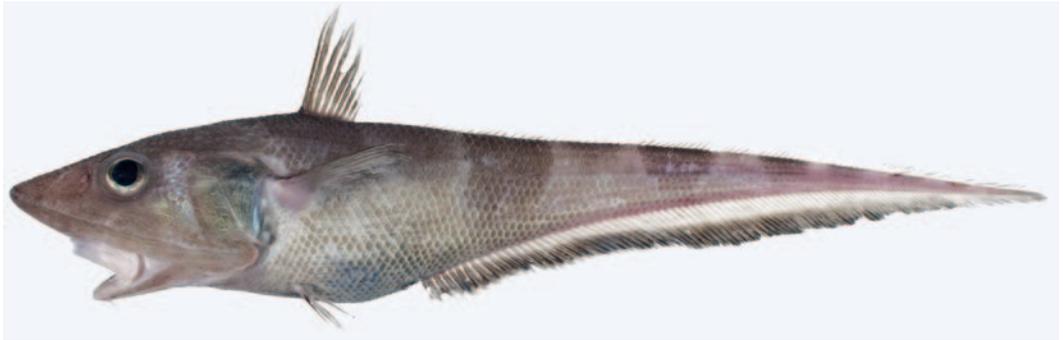


FIGURE 2. *Coelorinchus osipullus* sp. nov. Paratype, CSIRO H6005-04 (177 mm HL, 646 mm TL); Norfolk Ridge, 29°53.11'S, 167°49.04'E, 650–666 m; TAN0308, NORFANZ stn. 17; 14 May 2003. Photograph ©NORFANZ Founding Parties, photographers Robin McPhee (Te Papa) & Mark McGrouther (AMS).

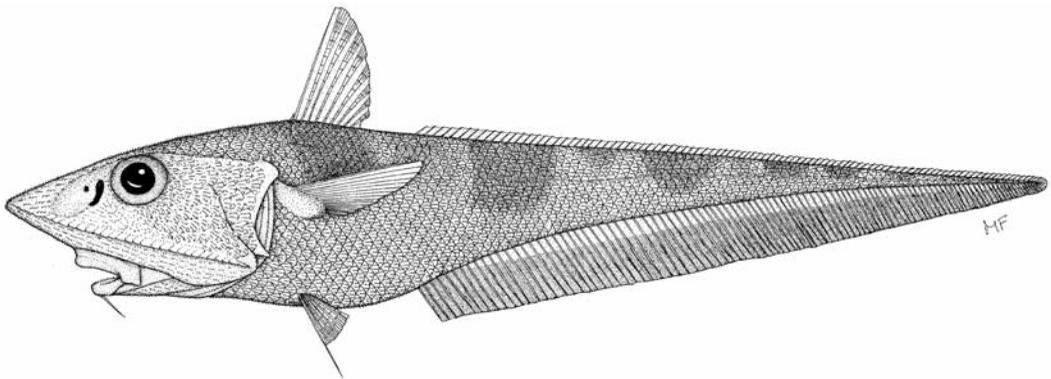


FIGURE 3. *Coelorinchus osipullus* sp. nov. Paratype, CSIRO H6005-04 (177 mm HL, 646 mm TL); West Norfolk Ridge, 29°53.11'S, 167°49.04'E, 650–666 m; TAN0308, NORFANZ stn. 17; 14 May 2003. Drawn by Michelle Freeborn (Te Papa).

Fresh color of body overall dark brownish dorsally and straw ventrally, bluish over abdomen and about $\frac{1}{3}$ to $\frac{1}{2}$ of chest; 9–11 distinct bars or saddles, interspersed in some specimens with sharply defined, narrow, pale, vertical to diagonal markings, although in others, body paler with pale spaces between dark saddles much broader. First saddle broad, deep, beginning on nape and spanning entire length of 1D and extending ventrally below lateral midline and pectoral fin; second through fourth saddle extending ventrally to about lateral midline. Odd-numbered saddles (first, third, fifth, etc.) usually much darker than others. Ventral half of body below lateral midline paler; small areas ventrally on abdomen (but not on chest anterior to pelvic bases and shoulder girdle) purplish. Dorsal surfaces of head and snout dark brown; underside including lips, gular and branchiostegal membranes pale to whitish but with dark pigmentation of gill cavity showing through membranes between uppermost branchiostegal rays. Mouth lining pale to blackish, except pale peripherally and at angles of jaws; gill and abdominal cavities black; gums dusky to black; lips pale. A faint, narrow, dark orbital ring. First dorsal fin blackish, long spinous ray with distal portion white; rays of second dorsal fin pale except over saddles, where they are black. Anal fin pale along base but with broad black distal margin over entire length of fin; anterior rays with additional white tips distal to black portions. Pectoral fins black except for uppermost and several lowermost rays pale or clear. Pelvic fins blackish except for outermost prolonged ray, which is whitish distally. Preserved specimens have less distinct but still obvious saddles on the body, anal fin with

broad black distal margin over entire length of fin, and gums of mouth dusky to black.

DISTRIBUTION.— Known only from seamounts of the Loyalty and Norfolk ridges between New Caledonia and New Zealand (Fig. 4). Capture depths ranged from 600 to 1340 m.

SIZE.— Attains a maximum size of more than 188 mm HL and 710 mm TL.

ETYMOLOGY.— The specific name is taken from the Latin *os* meaning mouth, and the Latin *pullus* meaning dusky or dark colored, and refers to the dark gums of this species.

COMPARISONS.— *Coelorinchus osipullus* is most similar

to *C. sheni* Chiou, Shao, and Iwamoto 2004, described from three specimens taken off Taiwan. The snout in *C. sheni* is broader and longer, reflected in the snout length, which is 41–56% of HL, compared with 39–42% in the new species. (See Table 1 for additional comparisons of proportions and counts.) The internasal and interorbital widths as a percentage of the snout length are greater in *C. sheni*, 51% and 61% of snout length, respectively, compared with 41–51% and 54–61% in *C. osipullus*. The ridges of the head are also significantly thicker and more spiny in *C. sheni*. The width across the outer edges of the occipital ridges is 39% of the snout length in a male paratype of *C. sheni* (CAS 215541), but only 30–33% in the new species. The posteroventral tip of the subopercle in *C. sheni* is not developed into a slender tag as it is in *C. osipullus*. The premaxillary teeth in *C. sheni* have an outer series of relatively large canine teeth, significantly larger than those in the new species. Pigmentation differences also exist: prominent black distal margin of anal fin in *C. osipullus*, compared with entirely black fin in *C. sheni*; and blackish gums in *C. osipullus*, compared with pale gums in *C. sheni*.

Iwamoto and Merrett (1997) and Merrett and Iwamoto (2000) confused the new species with *C. celaenostomus* McMillan and Paulin, 1993 (Fig. 5). The two species are readily distinguished, however, by several prominent features, including: (1) lips and mouth of *C. celaenostomus* intensely black (cf. pale to dusky in *C. osipullus*); (2) broad bluish band completely encircling trunk in *C. celaenostomus* (cf. pale bluish only over abdomen); (3) only five distinct saddles on body, those posteriorly indistinct if present (cf. 9–11 prominent saddles); (4) black margin of anal fin terminating well before end of tail (cf. extends to end of tail); (5) orbit diameter more than two times into snout length (cf. less than two times); (6) a small, narrow black dermal window of light organ anterior to anus (cf. no dermal window); (7) upper jaw teeth uniform, lacking enlarged outer series (cf. outer series slightly enlarged); and (8) and body scales below anterior end of second dorsal fin with five, at the most, widely spaced spinule rows (cf. closely spaced with six or seven rows). Other proportional and meristic characters also separate the two species (see Table 1).

The overall body and head shape, characteristics of the scales, absence of bony support for the anterolateral margin of the snout, small or inconspicuous light organ immediately anterior to anus,

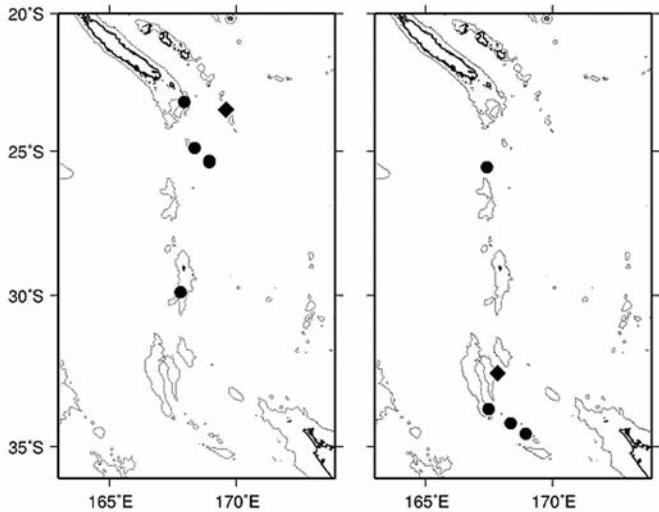


FIGURE 4 Collection localities of *Coelorinchus osipullus* sp. nov. (left) and *C. obscuratus* sp. nov. (right) in the Tasman Sea. Holotype locality is shown as a diamond.

TABLE 1. Counts and measurements of three *Coelorinchus* species. Data for *C. sheni* and *C. celaenostomus* mostly from original descriptions. Figures in square brackets for *C. sheni* from CAS 215541 (paratype).

	<i>C. osipullus</i> N = 10	<i>C. sheni</i> N = 3	<i>C. celaenostomus</i> N = 48
Total Length (mm)	224–710	420–937+	260–828+
Head Length (mm)	58–188	113–257	76–273
Measurements in %HL			
Snout Length	39–42	41–56	45–52
Preoral Length	23–31	[31]32–36	36–45
Internasal Width	16–20	20–21[23]	12–19
Interorbital Width	21–25	25–26	19–22
Orbit Diameter	20–25	20–21	17–23
Suborbital Width	13–15	[14]	9–12
Postorbital Length	35–39	37–40	27–34
Orbit to Preopercle	38–44	[40]	29–41
Upper Jaw	27–33	[29]30–37	26–33
Length Barbel	6–13	9–11	5–11
Length 1st Gill Slit	16–19	10–13[17]	
Body Depth	53–62	[56]	36–51
1D-2D Interspace	18–22	[15]22–23	13–23
Height 1D	44–50	45–48[49]	32–40
Length P	39–46	44–50	33–40
Length V	28–45	42	21–37
Interoccipital Space	12–13	[16]	
Counts			
1D (segmented rays)	8–9	8–9	7–8
P (excl. i)	16–19	18–19	13–17
GR-I (mesial)	8–9	9–10	8–11
GR-II (lateral)	6–8	6–8[9]	8–10
Scales 2D	5.5–6.5	4.5–5.0	6–8
Scales 1D	4.5–5.5	5–6	6–9
“ lat. line	36–43	33–41	47–51
Pyloric caeca	41–56 (2 spec.)		37–53 (mean = 44.6)

large unrestricted mouth with long bands of teeth in both jaws, and prominent saddle markings on the body relate these two species with *C. quadricristatus* (Alcock, 1891), *C. tokiensis* (Steindachner and Döderlein, 1887), *C. hexafasciatus* Okamura, 1982, and *C. longicephalus* Okamura, 1982. The last three species are readily distinguished from *C. osipullus* by their naked underside of head (except below the posterior end of the preopercle angle), small external dermal window of the light organ, and fully black anal fin. *Coelorinchus quadricristatus* shares most diagnostic features with the new species, but it lacks the prominent anal-fin markings, and it has a shorter first dorsal fin height (about 30–35% of HL, cf. 46–50%).

REMARKS.— The new species is part of a complex of at least seven species (*C. celaenostomus*, *C. hexafasciatus*, *C. longicephalus*, *C. quadricristatus*, *C. sheni*, *C. tokiensis*) that appears to be associated with islands and seamounts in tropical waters of the Pacific and Indian oceans. *Coelor-*

inchus tokiensis has been captured off southern Japan and the East China Sea, *C. hexafasciatus* and *C. longicephalus* off the Kyushu-Palau Ridge south of Japan, *C. sheni* off Taiwan, *C. quadricristatus* off the Andaman Islands in the Indian Ocean, *C. celaenostomus* off New Zealand's North Island, the Challenger Plateau, and the southern part of the Norfolk Ridge, and the new species on the northern part of the Norfolk and Loyalty ridges. Some aspects of the physiognomy of these fishes show peculiarities quite unlike those found in other members of the genus. Comparison of gene sequences and the internal morphology of this species complex should reveal its relationship with other clades within the large and diverse genus *Coelorinchus*. Species of this complex are among the largest members of the family Macrouridae (sensu stricto, excluding trachyrincids): *C. sheni* (>90 cm), *C. longicephalus* (>89 cm), and *C. celaenostomus* (>83 cm). They attain sizes that are exceeded by only a few members of the genera *Coryphaenoides* and *Macrourus*, and the North Pacific giant *Albatrossia pectoralis* (210 cm: Tuponogov et al. 2008:291).

***Coelorinchus obscuratus* McMillan and Iwamoto, sp. nov.**

Figures 6–7.

Coelorinchus sp. NFZ3: Clark and Roberts 2008: 51, App. 4 (listed).

DIAGNOSIS.— A species of *Coelorinchus* with an almost scaleless ventral surface of the head. Nasal fossa with large scaleless area anteriorly extending to nasal ridge and ventrally to or near suborbital ridge. No external evidence of a light organ, anus immediately before origin of anal fin. Snout long, about 2.0–2.3 into head length, with strong terminal scute, which is elongate ventrally, anterolateral margins not completely supported by bone. Body pale grayish-brown, lacking prominent markings; a narrow blackish eye ring; lips, mouth, and gill cavities dusky to black.

TYPE SPECIMENS.— (17 specimens, all collected by the R/V *Tangaroa*). — Holotype: NMNZ P.39373 (109 mm HL, 375 mm TL); West Norfolk Ridge, 32°36.39'S, 167°50.59'E, 1331–1345 m; TAN0308, NORFANZ stn. 121; 30 May 2003. Paratypes: **West Norfolk Ridge:** AMS I.42762–006 (2 spec., 63.2–111 mm HL, 220–381 mm TL) and CAS 218477 (2 spec., 62–75 mm HL, 209+ to 248+ mm TL); same station as holotype. NMNZ P.39553 (2 spec., 124–152 mm HL, 435+ to 450+ mm TL), AMS I.42769–003 (2 spec., 130–139 mm HL, 341+ to 446+ mm TL), CAS 218673 (1 spec., 118 mm HL, 385+ mm TL), and CSIRO H6083–01 (1 spec., 131 mm HL, 422 mm TL); 34°14.33'S, 168°21.18'E, 1195–1202 m; TAN0308, NORFANZ stn. 146; 3 June 2003. NMV A25175–003 (1 spec., 132 mm HL, 389+ mm TL), 34°34.26'S, 168°56.53'E, 1013–1350 m; TAN0308, NORFANZ stn. 156; 4 June 2003. CAS 218451 (4 spec., 26.5–59 mm HL, 90+ to 218 mm TL), 33°46.55'S, 167°29.28'E, 1431–1460 m; TAN0308, NORFANZ stn. 103; 29 May 2003. **Norfolk Ridge:** CAS 90752 (1 spec., 88 mm HL, 293 mm TL), 25°34'S, 167°25'E, 1132–1160 m; HALIPRO2, stn. BT 42; 15 Nov. 1996.

Counts and measurements (holotype in boldface, followed by range in paratypes).— 1D. **II**, 7, II, 7–9; P. **i15**, i14–i19; V. 7, 7; GR-I inner **2 + 5**, (0–2) + 5–7 (6–9 total) GR-II inner **1 + 6**, (0–2) + 5–7 (total 6–8) scales below 1D. **5**, 5–6, below mid-base 1D. **5**, 4–5.5; below 2D. **6**, 4.5–6; over distance equal to predorsal length **38**, 33–41; pyloric caeca **9**, 8–11 (10 spec.).

Total length **375**, 90–450 mm; HL **109**, 26.5–152 mm; preanal length **156**, 36–208 mm. The following in percent of HL: snout length **48**, 43–49; preoral length **45**, 39–47; internasal width **17**, 16–24; interorbital width **21**, 20–23; orbit diam. **23**, 21–29; suborbital width **13**, 12–15; postorbital length **29**, 27–31; distance orbit to preopercle angle **31**, 29–34; upper jaw length **20**, 19–29; length barbel 7, 2–9; length outer gill slit **10**, 5–12; body depth **45**, 29–44; interspace between 1D. and 2D. **15**, 12–19; height 1D. **35**, 30–41; length base 1D. **11**, 10–16; length P. **29**, 28–44; length outer V ray **30**, 26–45.

DESCRIPTION.— Body relatively shallow, greatest depth under origin of first dorsal fin about 2.2–3.4 into HL, body width across pectoral fin bases less than snout length, 2.1–2.5 into HL. Head



FIGURE 5. *Coelorinchus celaenostomus*. CSIRO H6054-01 (148 mm HL, 490 mm TL); West Norfolk Ridge, 33°49.47'S, 167°03.45'E, 804–944 m; TAN0308, NORFANZ stn. 93; 27 May 2003. Photograph ©NORFANZ Founding Parties, photographers Robin McPhee (Te Papa) & Kerryn Parkinson (AMS).

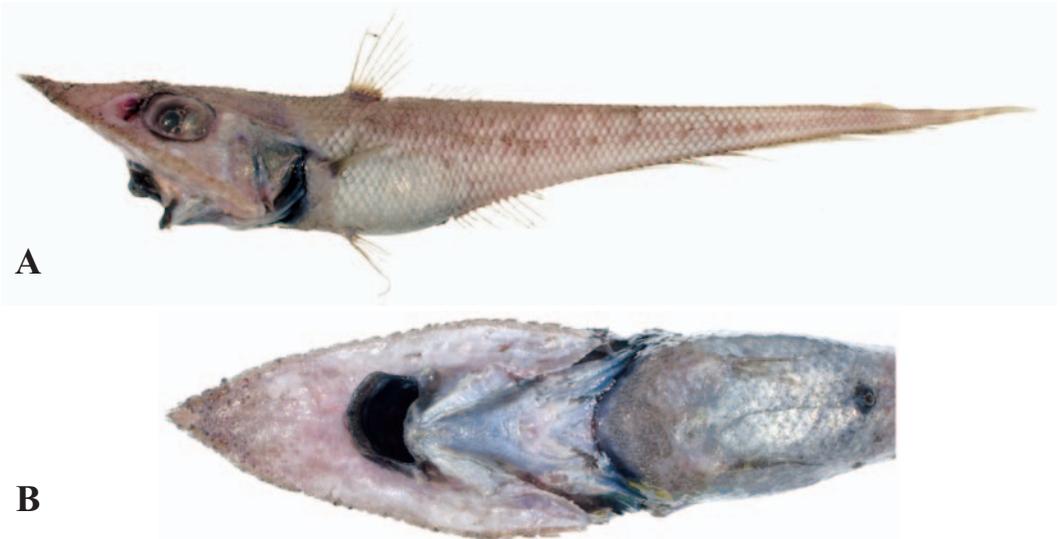


FIGURE 6. *Coelorinchus obscuratus* sp. nov. Holotype, NMNZ P.39373 (109 mm HL, 375 mm TL) West Norfolk Ridge, 32°36.39'S, 167°50.59'E, 1331–1345 m; TAN0308, NORFANZ stn. 121; 30 May 2003. (A) Lateral view; (B) ventral view of head and trunk. Photograph ©NORFANZ Founding Parties, photographers Robin McPhee (Te Papa) & Kerryn Parkinson (AMS).

long, 2.6–3.7 into total length. Snout long, about 1.5 times postorbital length, slender, and converging to a sharply pointed stout, well-defined terminal scute. Underside of head covered with dark long fine papillae, more prominent anterior to mouth. Mouth small, with anterior of lips about level with a vertical through nostrils; posterior end of maxilla below vertical through posterior two thirds of orbit. Lips thin and covered with small papillae in smaller specimens, thicker and more prominently papillated in larger specimens. Chin barbel small, slender, its length about a third of orbit. Greatest orbit diameter 1.6–2.3 into snout length, 3.5–4.7 into HL, 1.1–1.5 into distance orbit to angle of preopercle. Exposed posteroventral tip of subopercle small, finely pointed, extending to near posterior end of suborbital ridge. Suborbital ridge angular and armed with stout strongly spinulated scales, well defined from tip of snout posteriorly to near end of preopercle. Anterolateral margins of snout not completely supported by bone.

Teeth in upper jaw small, needle-like, in a broad uniform band. Teeth in lower jaw small, in a narrow band that extends back past rictus.

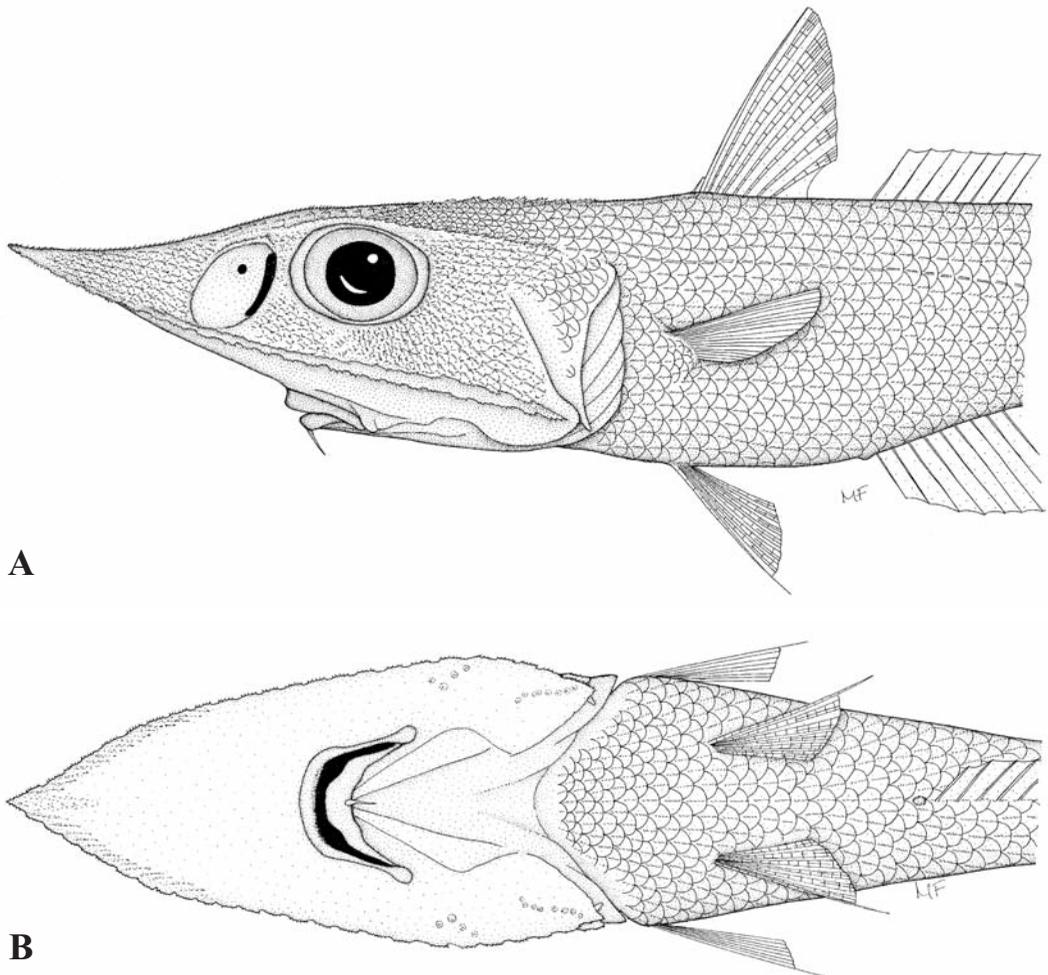


Figure 7. *Coelorinchus obscuratus* sp. nov. Holotype, NMNZ P.39373 (109 mm HL, 375 mm TL) West Norfolk Ridge, 32°36.39'S, 167°50.59'E, 1331–1345 m; TAN0308, NORFANZ stn. 121; 30 May 2003. (A) Lateral view of head and trunk; (B) ventral view of head and trunk. Drawn by Michelle Freeborn (Te Papa).

Origin of pectoral fin slightly ahead of pelvic fins, origin of first dorsal fin about level with a vertical through origin of pelvic fin. Fins except most rays of second dorsal fin well developed. First dorsal fin short, lacking any prolonged rays; its height much less than snout length (1.1–1.5 into snout length) and slightly more than distance orbit to preopercle; its base about equal to interspace between first and second dorsal fins (0.7–1.4 into interspace). Pectoral fin length about equal to height of first dorsal, its tip not extending to origin of anal fin. Pelvic fin with outer ray slightly prolonged into a hair-fine tip that does not extend to anal fin origin. Anal fin well developed, long based, extending to end of tail where it is confluent with second dorsal fin. Second dorsal fin low over almost entire length, its longest anterior rays slightly longer than barbel length.

Scales large, adherent, covered with discrete parallel rows of stout, arrow-head shaped overlapping spinules with the central spinule row enlarged. Scales below interspace of first and second dorsal fins with 6–10 rows of spinules. Nasal fossa almost completely lacking scales anteriorly to

the nasal ridge, and ventrally to the suborbital ridge or with a few rows of intervening small scales. Dorsal surface of head almost entirely covered with strong spinulated scales. Smaller specimens with thin naked longitudinal strips on dorsal head. Underside of head and lower jaw lacking scales except for 1–2 longitudinal rows of scales at posterior ends on each side of head, a few scales between posterior angles of lower jaw and suborbital ridge, and a few scute-like scales anteroventrally associated with suborbital ridge.

Fresh body coloration pale grayish-brown, lacking prominent markings. Larger specimens darker. Underside of head pale grayish-brown. Lips dusky to blackish (especially in young), oral cavity dark gray to blackish, and lining of gill cavity and branchiostegal membranes dark bluish-black. Narrow, dark orbital ring more prominent on the anterior, dorsal and ventral rim of orbit. All fins dusky in smaller specimens to blackish in larger specimens and lacking prominent markings. Dark and dusky coloration retained but less obvious in preserved specimens.

DISTRIBUTION.— Only collected from the continental slope of the West Norfolk Ridge west of New Zealand and the Norfolk Ridge south of New Caledonia (Figure 4). Capture depths ranged from 1013–1460 m. This species seems to be one of the deepest-dwelling members of the genus.

SIZE.— Attains a maximum size of more than 152 mm HL and 450 mm TL.

ETYMOLOGY.— The specific name is taken from the Latin meaning darkened or obscured.

COMPARISONS.— *Coelorinchus obscuratus* falls in the Species Group I of Iwamoto (1990) in having no external evidence of a light organ and having no prominent markings on the body. It is similar to *C. labiatus* (Koehler, 1896) from the eastern North Atlantic in having a long snout and an orbit marked with a blackish rim, but *C. labiatus* differs in having an entirely naked underside of head and in having the dorsal surface of head with broad naked areas behind the anterolateral edge of the snout. It also appears similar to *C. occa* (Goode and Bean, 1885) from the central North Atlantic, but that species lacks a blackish rim around the orbit and has much more coarsely spinulated scales. *Coelorinchus aratrum* Gilbert, 1905 is a similar long-snouted species from Hawaii but has fewer (3–5) divergent spinule rows and the first dorsal fin is black at the base, bright white distally. *Coelorinchus doryssus* Gilbert, 1905, also from Hawaii, appears to have a larger mouth and the scales on the dorsal head surfaces are minutely spinous.

REMARKS.— The new species may have a restricted distribution as it was not taken during sampling at depths of 395–2105 m in the New Caledonia region to the north (Iwamoto and Merrett 1997), and it was also not collected during numerous deepwater trawl samples around New Zealand to the south. The species may be difficult to sample because it appears to be deep living, with samples probably being taken closer to the maximum recorded depth and also because it appears to have a very low abundance as it was only taken in small numbers (17 total to date).

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