

2.7 FAMILY MERLUCCIIDAE

Fig. 710

MERLU

Family Name with Reference : *Merlucciidae* Gill, 1884, *Proc.Acad.Nac.Sci.Phila.*, 1884:167.

FAO Names : En - Hakes; Fr - Merlus; Sp - Merluzas.

General Features : Body long, slender and laterally compressed. Head large or medium-sized, and little depressed in most species; frontal bones separated, with ridges diverging from the occipital crest and bordering a large triangular depression; a low V-shaped ridge appears on upper side of head; neural spine of first vertebra firmly attached to supra-occipital bone of skull; mouth large, lower jaw slightly projecting beyond the upper in most species, end of upper jaw reaching below middle of eye; eye large, its diameter 1/2 to 1/5 of head length; strong, pointed teeth in jaws in most species; teeth in upper jaw biserial or in a single row; teeth also present on vomer but not on palatines; no barbel on chin; branchiostegal rays 7. Two dorsal and one anal fins; first principal rays spinous in most species; dorsal fin, better developed than the anal; pectoral fins rather long and high in position; pelvic fins with 7 to 10 rays and normally developed in most species; caudal fin truncated or tapering. Anus situated close to origin of anal fin in most species. Scales small, cycloid. Colour: usually steel grey on back, silvery white on sides and belly; more blackish in some species (*Merluccius*), usually light blue on back, silvery white on belly, fins blackish (*Macruronus*) and upper parts light brown, belly purplish (*Steindachneria*).

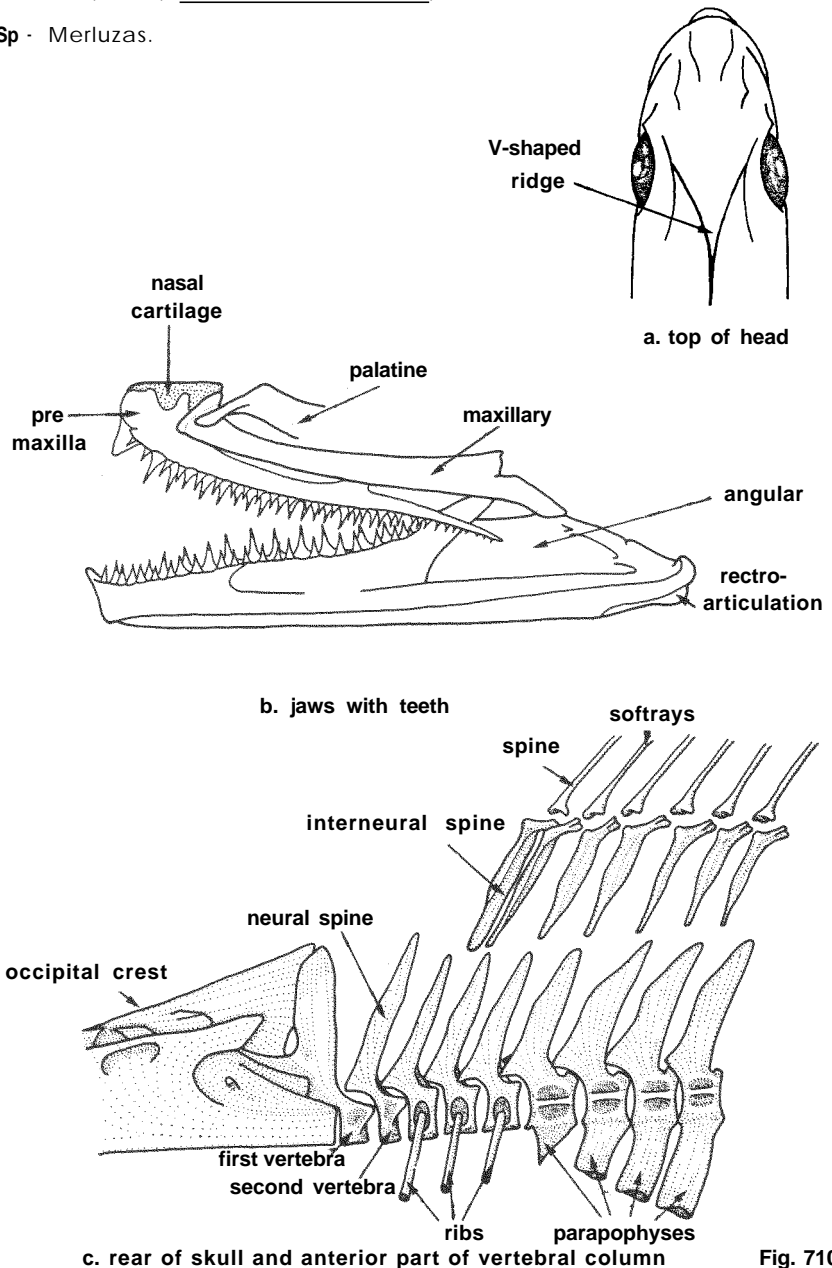


Fig. 710

Habitat, Distribution and Biology : The distribution of the family is illustrated on the map below. The thirteen species of *Merluccius* are distributed on both sides of the Atlantic Ocean, in the eastern Pacific Ocean and off southern New Zealand. These fishes inhabit the continental shelf and upper slope, but some enter estuaries and/or very deep waters over 1 000 m depth. They are voracious predators, but their food preferences change during growth. Most undertake diurnal vertical movements and spawn in spring or in summer.

The three species *Macruronus* are distributed in Subantarctic waters including southern South America, South Africa, southern Australia and New Zealand. They live in large schools on the continental shelf.

The genus *Lyconus* consists of an unknown number of species from the Atlantic (where it apparently has an antitropical distribution) and from the Southwest Pacific.

The genus *Steindachneria* is represented by a single species from deep waters of the Gulf of Mexico and the Caribbean.

The biology of the last 3 genera is poorly known at present

Interest to Fisheries : Most fisheries for merlucciids have developed recently (the hakes having been considered to be trash fish in the past); eleven species of *Merluccius* and two species of *Macruronus* are now being exploited. Worldwide catches of merlucciids amounted to 1 977 837 t in 1987, which make the Merlucciidae the second-most important family of the Gadiformes (Table II).

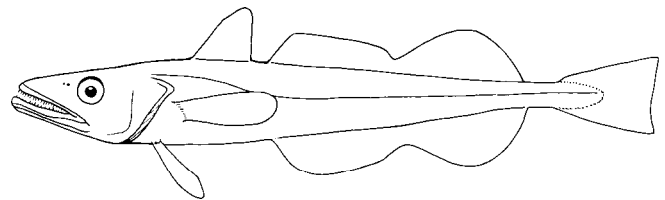
As can be seen from the above table, about 30% of the 1987 catches of merlucciid species were taken in the South-West Atlantic (Fishing Area 41) and 23% in the eastern Central Atlantic (Fishing Area 34). The other fishing areas from which catches were reported are, in decreasing order of importance: NE Pacific (67), SE Pacific (87), SW Pacific (81), NW Atlantic (21), NE Atlantic (27), Mediterranean and Black Seas (37), SE Atlantic (47), WC Atlantic (31) and EC Pacific (77). The most important species landed were: *Merluccius hubbsi* (22.9% of the world catch), and *Merluccius capensis* and *Merluccius paradoxus* (combined 22.4%), followed by *Merluccius productus*, *Macruronus novaezelandiae*, *Macruronus magellanicus*, *Merluccius merluccius*, *Merluccius polylepis*, *Merluccius bilinearis*, *Merluccius gayi*, *Merluccius senegalensis*, *Merluccius australis* and *Merluccius polli*. It should be noted that *Merluccius polylepis* which is considered a synonym of *Merluccius australis* by the present author, is treated separately in the FAO statistics. Otter trawls are the main fishing gear in hake fisheries, but traps and pound nets are also used. Hakes are marketed fresh, frozen, chilled as fillets, frozen not as fillets, dried, salted, in brine, canned and as fish meal.

Literature : Svetovidov (1948); Maul (1951); Ginsburg (1954); Franca (1962); Grinols & Tillman (1970); Inada (1981a).

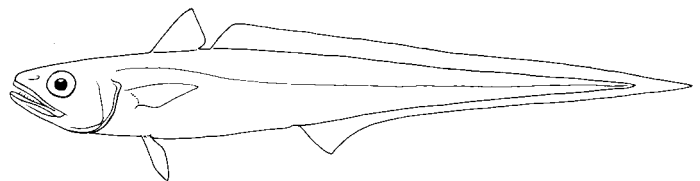
Remarks : Some workers still prefer to recognize the Merlucciidae as a subfamily of the Gadidae, but more recent work suggests that they should be considered as a separate family (Marshall, 1966; Cohen, 1984; Nelson, 1984). The classification adopted in this catalogue follows Cohen (1984), who recognized 4 living genera (2 extinct genera are not mentioned here). In addition to the 3 species of *Macruronus* recognized here, two other nominal forms (*M. caninus* Maul and *M. maderensis* Maul) have been wrongly included in this genus. According to D. Cohen, the first is an early life history stage of *Lyconus*, and the second belongs to the family Macrouridae.

Key to Genera:

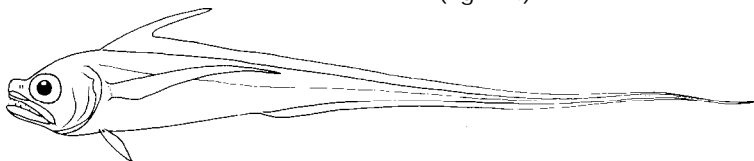
- 1a. Anus and urogenital opening situated close together; luminescent organ absent (subfamily Merlucciinae)
 - 2a. Two distinct dorsal fins
 - 3a. A separate caudal fin present *Merluccius* (Fig. 711)
 - 3b. No separate caudal fin *Macruronus* (Fig. 712)
 - 2b. Dorsal fin single *Lyconus* (Fig. 713)
- 1b. Anus and urogenital opening widely separated; luminescent organ present (subfamily Sterndachneriinae) *Steindachneria* (Fig. 714)



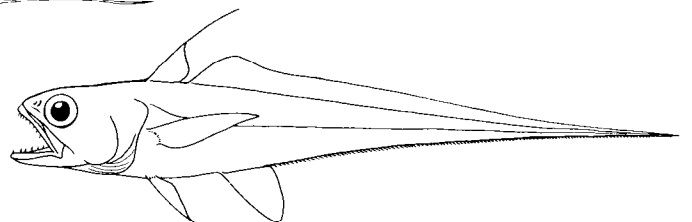
Merluccius Fig. 711



Macruronus Fig. 712



Lyconus Fig. 713



Steindachneria Fig. 714

TABLE II
1987 LANDINGS OF MERLUCCIIDAE IN METRIC TONS REPORTED TO FAO

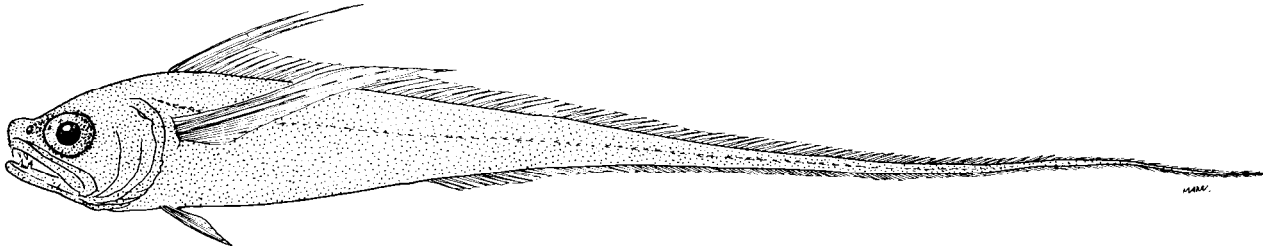
Species	Total	21	27	31	34	37	41	47	67	77	81	87
<i>M. merluccius</i>	116 987		72 455		9 947	34 585						
<i>M. senegalensis</i>	7 469				7 469							
<i>M. australis</i>	3 800										3 800	
<i>M. bilinearis</i>	77 975	77 956		19								
<i>M. gayi</i>	64 286											64 286
<i>M. hubbsi</i>	434 472						434 472					
<i>M. prodoctus</i>	297 976								297 966	10		
<i>M. polli</i>	77							77				
<i>M. polylepis</i> (subpopulation of <i>M. australis</i>)	110 993						54 375					56 618
<i>M. capensis</i> and <i>M. paradoxus</i>	444 348				444 348							
<i>Merluccius</i> spp.	90				71			19				
<i>Macruronus</i> <i>magellanicus</i>	181 005						49 171					131 834
<i>Macruronus</i> <i>novaezelandiae</i>	194 274										194 274	
<i>Macruronus</i> spp.	44 085						44 085					
Total	1 977 837	77 956	72 455	19	461 835	34 585	582 103	96	297 966	10	198 074	252 738

Lyconus Günther, 1887

Fig. 715

MERLU Lyco

Genus with Reference : *Lyconus* Günther, 1887: 158. Type-species: *Lyconus pinnatus* Günther, 1887, by monotypy.



(after Günther, 1887)

Lyconus pinnatus

Fig. 715

Diagnostic Features : Body elongate, compressed, with a long, tapering tail lacking a separate caudal fin. Head moderate-sized, about 1/18 of body length, composed of thin bones with narrow mucous channels except in the interorbital space; mouth terminal, large and oblique; end of upper jaw extending beyond middle of orbit; snout short, its tip rounded; eye large, lying immediately below upper profile, its diameter about 1/3 of head length and longer than snout length; interorbital space rather flat and narrower than eye diameter; both jaws armed with a series of widely set teeth, unequal in size, two on tip of upper jaw being canine-like but not as large as the two long lateral fangs of lower jaw; vomer with a single canine-like tooth on each side; no barbel on chin; opercles very thin; infraorbital bone separating maxilla from eye narrow. Dorsal and anal fins long and continuous, composed of very delicate, simple rays; origin of dorsal fin situated above base of pectoral fins; anal fin origin located immediately behind anus, its rays considerably shorter than those of dorsal fin; pectoral fins with 13 rays, directed obliquely upwards and exceedingly elongate, the middle rays extending far beyond anus; pelvic fins thoracic, composed of 10 rays and situated below bases of pectoral fins. Scales very small, thin, cycloid and deciduous.

Interest to Fisheries : None

Literature : Günther (1887); Holt & Byrne (1906); Nelson (1984).

Remarks : A poorly known genus with an unknown number of species. Two, small, rare species have been described so far (Nelson, 1984). One of them, *Lyconus pinnatus* Günther, 1887, was described from a 12.5 cm specimen caught in the middle of the South Atlantic. Günther noted that there is no break in the continuity of the dorsal fin, but some of its anterior rays are much prolonged; as this portion is injured, no more precise information can be given. The other species, *Lyconus brachycolus* Holt & Byrne, 1906 was described from the eastern North Atlantic.

List of species*

Lyconus brachycolus Holt & Byrne, 1906

Lyconus pinnatus Günther, 1887

Macruronus Günther, 1873

MERLU Macru

Genus with Reference : *Macruronus* Günther, 1873: 103. Type-species: *Coryphaenoides novae-zelandiae* Hector, 1871.

Diagnostic Features : Body elongate, compressed, with a long tapering tail lacking a separate caudal fin. Head moderate-sized, about 1/6 of body length; mouth large and oblique; tip of lower jaw protruding slightly beyond the upper; end of upper jaw extending to below middle of eye; snout long and bluntly pointed, its length 1.3 to 1.5 times the eye diameter; eye large, 1/5 to 1/4 of head length; interorbital space flat, its width almost equal to eye diameter; suborbital ridge absent; teeth in upper jaw biserial or in a single row; those in lower jaw in a single row; several teeth in both jaws long and sharp; small teeth present on vomer, none on palatines; no barbel in chin; gill rakers slender, their length about half of eye diameter; number of gill rakers on lower limb of first arch 11 to 27;

* Probably includes other species. The genus is being currently revised by D. Cohen

branchiostegal rays 7. First dorsal fin with 8 to 13 rays, high, triangular and short based; second dorsal fin better developed than anal fin with 88 to 120 rays; anal fin with 75 to 105 rays; origin of first dorsal fin slightly behind those of pectoral fins in most species; Inner space between dorsal fins very short; origin of second dorsal fin well forward of anal fin origin; anal fin origin slightly forward of mid-point of body; anterior rays of anal fin usually forming a lobe; pectoral fins longer than pelvics in most species, and extending to below first dorsal fin origin; pelvic fins with 8 to 10 rays, situated slightly behind and below pectoral fin origins. Anus just in front of anal fin origin. Scales thin, small and cycloid. **Colour:** dorsal surface silvery with a purple or blue-green tinge; belly silvery, slightly bluish; fins darker, small melanophores scattered on fin membrane of dorsal and anal fins.

Habitat, Distribution and Biology : Distributed in the temperate waters of the southern hemisphere: off Cape Town, South Africa, southern Australia and Tasmania, southern New Zealand, southern Chile and off Argentina. Benthic species, living mainly in the shelf zone, but some seasonally present on the upper slope, in depths from 30 to 650 m; occasionally taken in open sea midwaters. They migrate southward in spring and summer, and northward in winter. Spawning occurs from winter to early spring in deep waters of the continental slope. Young fish are found in shallow waters of the continental shelf. One-year-old fish (about 25 cm total length) begin to move to the edge of the shelf and onto the upper continental slope. Sexually maturity is attained at 3 years of age (60 cm fork length). They are fish-eating carnivores feeding exclusively on lantern fishes.

Interest to Fisheries : *M. novaezelandiae* and *M. magellanicus* are now regularly fished by trawling and became the third-most important merluccid fishery (after *Merluccius capensis* and *paradoxus* combined, and *Merluccius hubbsi*). The total catch reported to FAO in 1987 attained 419 364 t for both species (194 274 t and 181 005 t respectively). Of these landings, Chile alone caught 131 834 t.

Literature : Maul (1951); Marshall (1966).

Key to Species:

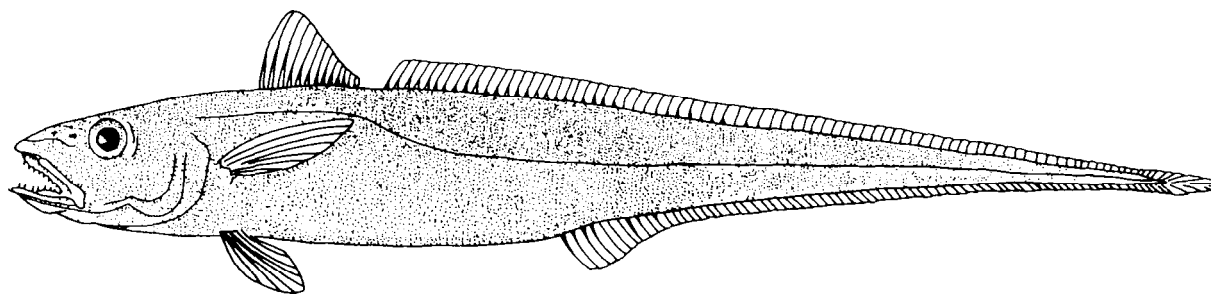
- 1a. Total number of gill rakers on first arch 30 to 34 (mode 32) *M. magellanicus*
(Argentina, Chile)
- 1b. Total number of gill rakers on first arch 27 to 30 (mode 19)
- 2a. Canine-like teeth on tip of upper jaw present; interorbital width 4.2 to 4.6 times in head length *M. novaezelandiae*
(New Zealand, Tasmania)
- 2b. Canine-like teeth on tip of upper jaw absent; Interorbital width 4.1 to 4.2 times in head length *M. capensis*
(South Africa)

List of species

Macruronus capensis Davies, 1950
Macruronus magellanicus Lönnberg, 1907
Macruronus novaezelandiae (Hector, 1871)

Macruronus capensis Davies, 1950

Fig. 716

MERLU Macru 1**Scientific Name with Reference** : *Macruronus capensis* Davies, 1950, Ann.Mag.Nat.Hist., 12(3):512.**Synonyms** : None**FAO Names** : **En** - Cape grenadier; **Fr** - Grenadier du cap; **Sp** - Grenadero del Cabo.

(after Davies, 1950)

Fig. 716

Diagnostic Features : Body depth 6.3 to 7.2 times in body length; head length about 6 to 6.1 times in total length. Measurements relative to head length: lower jaw 1.5 to 1.9 times; snout 2.9 to 3.3 times; eye diameter 3.8 to 4.6 times; interorbital width 4.1 to 4.2 times. Teeth in both jaws conical, more or less uniform in size, strongly curved and in a single series; 6 to 10 teeth on each side of lower jaw, 12 to 18 on each side of upper jaw; no canine-like teeth on tip of upper jaw; number of gill rakers on first arch, 6 or 7 on upper limb and 21 to 23 on lower limb, 27 to 29 in total. First dorsal fin with 1 spine and 11 to 13 rays; second dorsal with approximately 88 to 98 rays; anal fin with 75 to 102 rays; pectoral fins with 15 to 20 rays, their lengths 1.3 to 1.6 times in head length; pelvic fins with 8 rays, their lengths 1.8 to 2 times in head length. **Colour**: dorsal side of body blackish blue, sides and belly silvery white, all fins blackish.

Geographical Distribution : Off South Africa: in deep waters off the Cape of Good Hope, Mossel Bay and off Algoa Bay (Fig. 717).

Habitat and Biology : Only few individuals have been caught until now. Probably inhabiting very rough bottom or mid-waters.

Size : Recorded maximum length about 1 m.

Interest to Fisheries : None at present.

Local Names : SOUTH AFRICA : Bandstert, Strap-tail.

Literature : Davies (1950); Smith (1965).

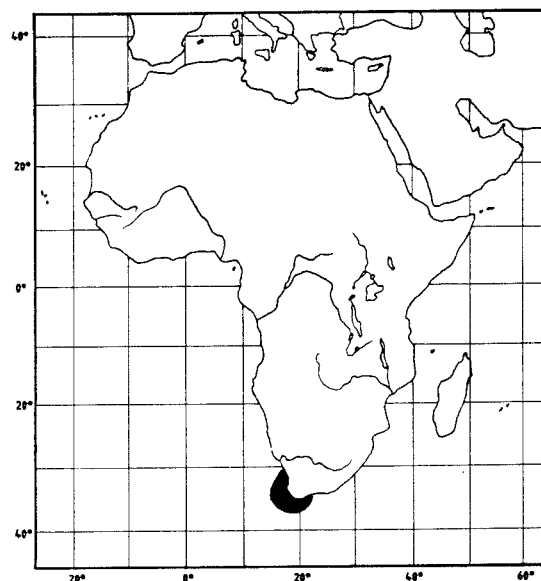


Fig. 717

Macruronus magellanicus Lönnberg, 1907

Fig. 718

MERLU Macru 2

Scientific Name with Reference : *Macruronus magellanicus* Lönnberg, 1907, Hamb.Magalh.Sammerlr., Fische:15.

Synonyms : *Macruronus novae-zelandiae* Günther, 1880; *Macruronus argentinae* Lahille, 1915.

FAO Names : En - Patagonian grenadier; Fr Grenadier Patagonien; Sp - Merluza de cola.

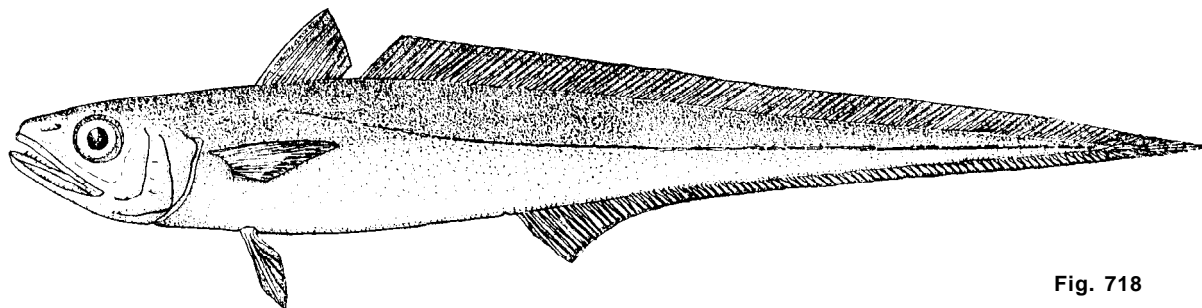


Fig. 718

Diagnostic Features : Body depth 6.7 to 8.1 times in body length; head length 4.75 to 6.6 times in total length. Measurements in relation to head length: interorbital width 4 to 4.8 times; upper jaw 1.7 to 2 times; lower jaw 1.5 to 1.6 times; snout length 3 to 3.3 times; eye diameter 3.2 (young) to 4.4 times. Teeth in lower jaw stronger than those in upper jaw; about 10 conical teeth in upper and 7 to 9 in lower jaw; canine-like teeth on tip of upper jaw present; gill rakers on first arch 7 or 8 on upper limb, 23 to 27 on lower limb, 30 to 34 in total. First dorsal fin with 1 spine and 10 to 13 rays; second dorsal with about 90 to 100 rays; anal fin with 83 to 90 rays; pectoral fins with 17 to 19 rays, their lengths 1.3 times in head length; pelvic fins 8 rays, their length 1.6 to 2.1 times in head length. **Colour**: dorsal side of body purplish blue, belly silvery with a slight bluish tinge; small melanophores scattered on fin membrane of dorsal and anal fins, inside of mouth blackish.

Geographical Distribution : Both sides of southern South America. Off Argentina, found on the continental shelf and slope from Buenos Aires to the Straits of Magellan. Off southern Chile, distributed from Chiloé Island to the southern tip of Tierra del Fuego (Fig. 719).

Habitat and Biology : A benthic, schooling species found in depths from 30 to 500 m, concentrated on the outer part of the continental shelf. The Patagonian grenadier migrates southward in spring and summer, and northward in winter. Spawning occurs in winter (June-August), mainly in mid-waters. The main spawning grounds off Argentina are the Gulf of San Matias (south of 48° S), in waters of about 100 m depth. The spawning population includes fishes over 30 cm in preanal length. Feeds mainly on fish (herrings, anchovies, lantern fishes); also on mysids, cephalopods, euphausiids and amphipods.

Size : Maximum total length about 1.1 m (5 kg weight); common from 70 to 90 cm.

Interest to Fisheries : Caught mainly off southern Chile. The total catch amounted to 181 005 t in 1987, most being taken by Chile (131 834 t) on the Pacific side, and to Poland (26 685 t) on the Atlantic side. Caught with bottom trawls and utilized fresh, frozen and for fish meal.

Local Names : ARGENTINA: Argentino, Merluza de cola; CHILE: Huaica, Hualca, Huilca, Merluza cola de rata, Merluza de cola.

Literature : Lahille (1915); Norman (1937); Hart (1946); Inada (1986)

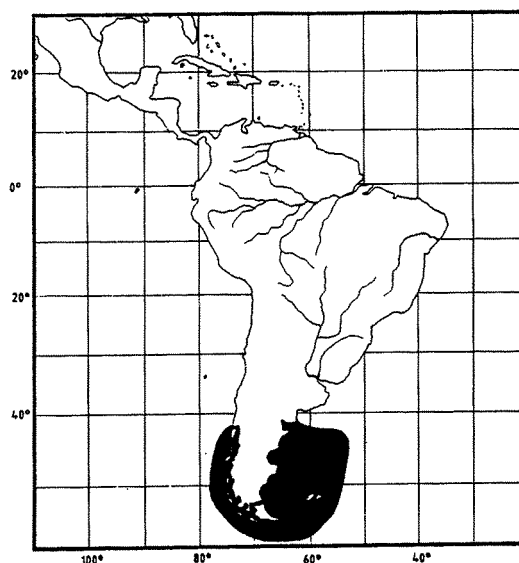


Fig. 719

Macruronus novaezelandiae (Hector, 1871)

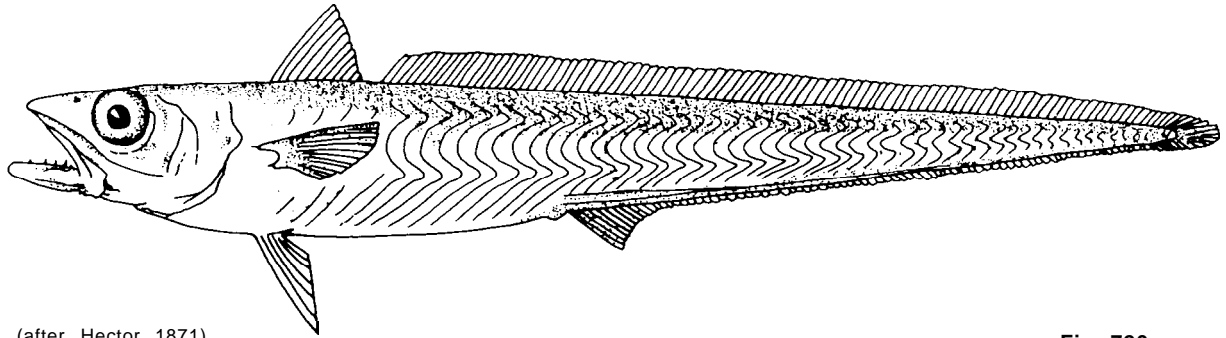
Fig.720

MERLU Macru 3

Scientific Name with Reference : *Coryphaenoides novae-zelandiae* Hector, 1871, Trans.New Zeal.Inst., 3:136.

Synonyms : None

FAO Names : **En** - Blue grenadier; **Fr** - Grenadier bleu; **Sp** - Cola de rata azul



(after Hector, 1871)

Fig. 720

Diagnostic Features : Body depth 6.7 to 8.5 times in body length; head length 5.3 to 6.3 times in total length. Measurements in relation to head length: lower jaw 1.5 to 1.6 times; snout 2.2 to 3.2 times; eye diameter 3.5 to 4.6 times; interorbital width 4.2 to 5.1 times. Teeth in upper jaw in two series, the inner with small, regular teeth, the outer with large and sharper teeth; a single series of large teeth in lower jaw; canine-like teeth present at tip of upper jaw. Number of gill rakers on first arch 6 or 7 on upper limb and 21 to 24 on lower limb, 27 to 30 in total. First dorsal fin with 1 spine and 10 to 12 rays; second dorsal with 96 to 102 rays; anal fin with 89 to 95 rays; pectoral fins with 15 to 18 rays, their length 1.3 to 1.5 times in head length; pelvic fins with 8 rays, their length 1.7 to 2.1 times in head length. Scales on lateral line about 182. **Colour**: dorsal surface silvery, with a purple or blue-green tinge; silvery on sides and belly; fins darker.

Geographical Distribution : New Zealand, southern Australia and Tasmania. In New Zealand, most abundant around South Island, Chatham Rise, and Campbell Plateau; uncommon around the North Island. In Australia, found off Tasmania, Victoria, New South Wales, South Australia and southwestern Australia (Fig.721).

Habitat and Biology : A benthic, schooling species found in depths between 450 and 700 m. Juveniles smaller than 40 cm in total length are common in large estuaries and bays, and may even enter freshwaters. Appears to live usually on or near the bottom, but may occasionally move up into mid-waters. Spawning occurs in winter (January to September) on the continental slope. After the planktonic larval phase, the young move to shallow waters over the continental shelf. At the age of one year, they are 24 cm long and begin to move to the edge of the shelf and onto the upper continental slope. Sexual maturity occurs after the third year (at about 60 cm total length). A fish-eating carnivore, even the juveniles feeding predominantly on lantern fishes.

Size : Maximum length about 1.2 m, common from 60 to 100 cm (1.5 kg weight).

Interest to Fisheries : Caught mainly off New Zealand. The total catch reported to FAO in 1987 amounted to 194 274 t, of which 160 763 t were taken by New Zealand and the remainder by the USSR, Japan and Republic of Korea. It is also caught commercially off Tasmania. Fished mainly by trawling and processed as frozen fillets or blocks; flesh delicate, white, moist and suitable for most methods of cooking.

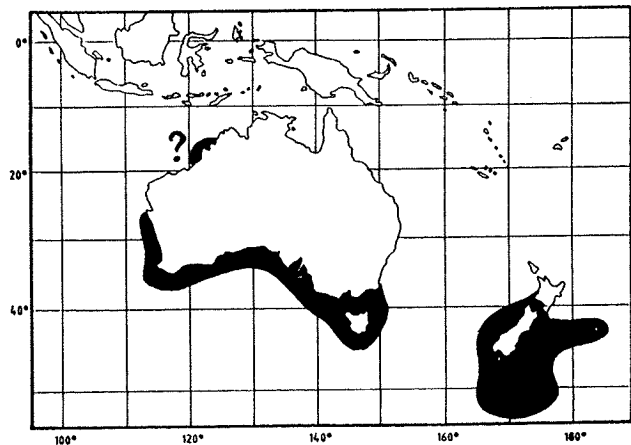


Fig. 721