

(after Bini, 1969)

Fig. 97

**Diagnostic Features** : No large canine teeth at front of upper jaw. First dorsal ray short, equal to or not much longer than eye diameter; pectoral-fin rays 20 to 22. **Colour** : pale cream to pink or reddish with brown blotches, mainly on the dorsal half of head and body and extending onto the dorsal fin.

**Geographical Distribution** : From the central Norwegian coast and the Faeroe Islands southwards through the North Sea and around the British Isles to the region around the Straits of Gibraltar, and the western and northern coasts of the Mediterranean (Fig. 98).

**Habitat and Biology** : Benthic at depths from 10 to 120 m on rocky bottoms but also on mud, sand and gravel. Spawns from May to August in western Ireland, in spring and summer in the Mediterranean. Eggs and larvae are pelagic. Growth is rapid: at 1 year, 18 cm, at 2 years, 23 cm; at 3 years, 27 cm, at 4 years, 31 cm, at 5 years, 34 cm, and at 6 years, 36 cm. Feeds on shrimps, crabs, isopods, small fish, molluscs and polychaetes.

**Size** : Reaches about 60 cm total length.

**Interest to Fisheries** : A common species, often taken by trawls, bottom longlines and hand lines. Occasionally found on markets, usually fresh. The flesh is difficult to preserve.

**Local Names** : BULGARIA: Galja; DENMARK: Tredadet havkvabbe; FRANCE: Motelle commune; GREECE: Agoullanós; ITALY: Motella maculata; MALTA: Ballotra; SPAIN: Lota; UK: Three-bearded rockling; YUGOSLAVIA: Ugorova majka pecatica.

**Literature** : Bini (1969); Wheeler (1969); Svetovidov (1986); Fischer, Bauchot & Schneider, eds (1987).

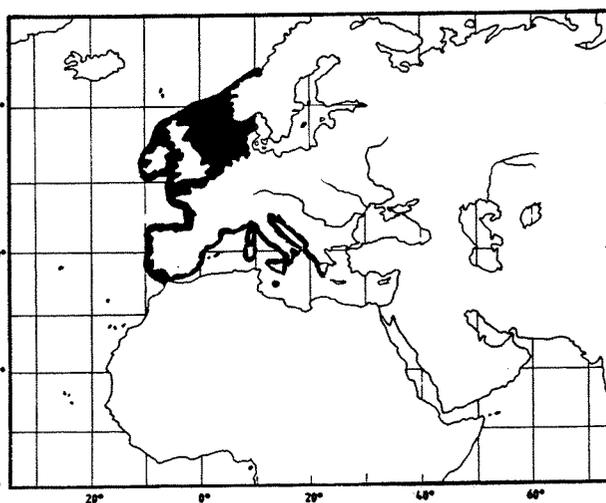


Fig. 98

Lota

GADI Lota

**Genus with Reference** : *Lota* Cuvier in Oken, 1817, *Isis*:1182.

**Diagnostic Features** : See species

**Remarks** : Treated as three subspecies by Svetovidov (1948) and others; however, Scott & Crossman (1973) do not agree and recognize only a single form.

***Lota lota*** (Linnaeus, 1758)

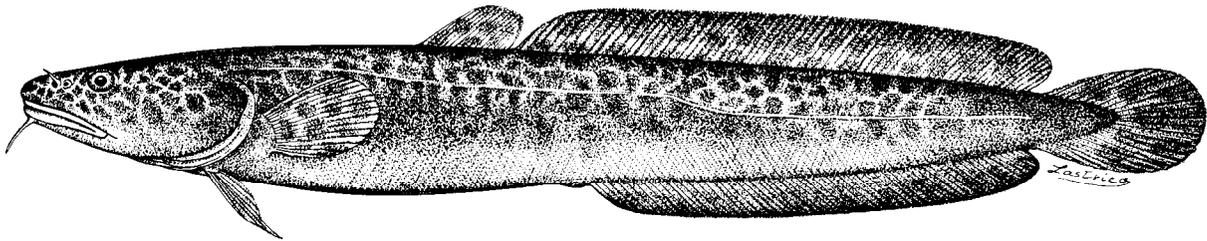
Fig. 99

GADI Lota 1

**Scientific Name with Reference** : *Gadus lota* Linnaeus, 1758, *Syst.Nat.*, ed.X:255.

**Synonyms** : *Enchelyopus lota*, Bloch & Schneider, 1801; *Gadus lacustris* Walbaum, 1792; *Gadus maculosa* Le Sueur, 1817; *Gadus compressus* Le Sueur, 1817; *Molva maculosa* Le Sueur, 1819; *Molva lota*, Fleming, 1828; *Lota brosmina* Storer, 1839; *Lota maculosa*, De Kay, 1842; *Lota compressa*, De Kay, 1842; *Lota inornata* de Kay, 1842; *Lota vulgaris* Kessler, 1864; *Lota linnei* Malm, 1877; *Lota vulgaris obensis* Anikin, 1902; *Lota lota kamensis* Markun, 1936; *Lota lota lota*, Hubbs & Schultz, 1941; *Lota lota leptura* Hubbs & Schultz, 1941; *Lota lota maculosa*, Hubbs & Schultz, 1941.

**FAO Names** : **En**- Burbot; **Fr** - Lotte de rivière; **Sp** - Lota de rio



(adapted from Svetovidov, 1948 and from Scott & Crossman, 1973)

Fig. 99

**Diagnostic Features** : Anterior nostril with a prominent barbel-like flap. Teeth all small and brush-like. Dorsal fins two; anal fin one; none connected with caudal fin; first dorsal ray followed by similar rays, 9 to 16 rays in total; pelvic fin with a slightly elongate ray, falling short of end of pectoral fin. Lateral line continuous to about end of dorsal- and anal-fin bases, interrupted to end of body. **Colour** : yellow, light tan to brown overlaid by a pattern of darker brown or black.

**Geographical Distribution** : Circum-arctic in freshwater, in some areas as far south as 40° (Fig. 100).

**Habitat and Biology** : Found on the bottom of lakes and rivers at depths that vary seasonally from ca. 0.5 to 230 m. The burbot spawns from November to May, considering its whole area of distribution, but mainly from January to March in Canada, and in December in the Anadyr River (USSR). Spawning takes place at night, usually under the ice in shallow waters (ca. 0.5 to 3 m depth) at surface temperatures ranging from 0.6° to -1.7°C. over sand or gravel. The eggs are semipelagic. Fecundity estimates in Canada range from 45 600 eggs in a 34 cm female to 1 362 077 eggs in a 64 cm female. Growth in the first 4 years is rapid, but decreases thereafter. The young attain lengths of 7.6 to 21 cm by the end of the first year; in Lake Simcoe, Ontario, burbot at age 5 average about 55 cm total length. The maximum life expectancy is probably 15 years. The burbot is a voracious predator and night feeder. Small burbot feed on insect larvae, crayfish, molluscs and other invertebrates, but relatively few fishes, while individuals over 50 cm total length feed almost exclusively on fishes. It is an important competitor for food of lake trout and white fishes.

**Size** : May reach 120 cm or more in total length; common size to about 40 cm

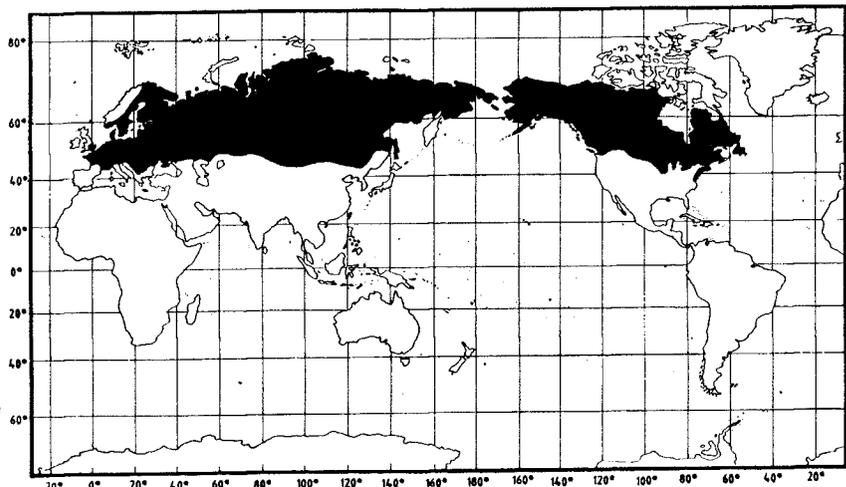


Fig. 100

**Interest to Fisheries** : Fished commercially in Finland, Sweden and the European part of USSR, while it is of minor commercial importance in Alaska and Canada. The catch reported for 1987 in the FAO Yearbook of Fishery Statistics totalled 1 577 metric tons (Finland: 1 540 t; Sweden 37 t). Marketed mainly salted or used as pet food.

**Local Names** : CANADA: American burbot, Burbot, Eelpout, Freshwater eel, Lawyer, Ling, Maria, Methy; USA: Burbot, Lush (Alaska).

**Literature** : Svetovidov (1948); Scott & Crossman (1973) .

***Melanogrammus***

**GADI Mela**

**Genus with Reference** : *Melanogrammus* Gill, 1862 (1863), Proc.Acad.Nat.Sci., Philad.: 280.

**Diagnostic Features** : See species.

**Remarks** : A single species in the genus:

***Melanogrammus aeglefinus* (Linnaeus, 1758)**

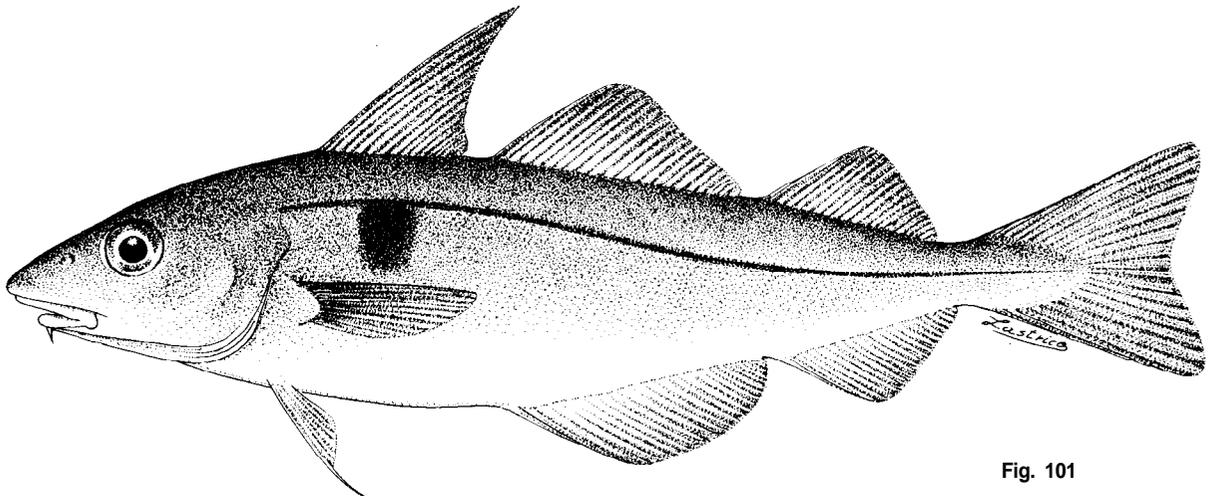
**Fig. 101**

**GADI Mela 1**

**Scientific Name with Reference** : *Gadus aeglefinus* Linnaeus, 1758, Syst.Nat., ed.X:251.

**Synonyms** : *Morhua aeglefinus*, Fleming, 1828; *Aeglefinus linnei* Malm, 1877.

**FAO Names** : En - Haddock; Fr - Eglefin; Sp - Eglefino.



**Fig. 101**

(adapted from Bigelow & Schroeder, 1953 and from Quéro, 1984)

**Diagnostic Features** : Palatine teeth lacking. Chin barbel rather small. Lower jaw shorter than upper. Three dorsal fins, two anal fins, all separate from each other; first anal fin base short, less than one-half of preanal distance. Lateral line dark, uninterrupted to the end of body, or nearly so. Lateral-line pores present on head. Scales overlapping. **Colour** : large dark blotch above pectoral fin.

**Geographical Distribution** : In the eastern North Atlantic from the Bay of Biscay to Spitzbergen; in the Barents Sea to Novaya Zemlya; around Iceland; rare at the southern Greenland. In the western North Atlantic from Cape May, New Jersey to the Strait of Belle Isle (Fig. 102).

**Habitat and Biology** : A demersal species found from 10 to 450 m depth, more common from 80 to 200 m, over rock, sand, gravel or shells, usually at temperatures between 4° and 10°C. Haddock undertake extensive migrations in the Barents Sea and Iceland, and more restricted movements in the northwestern Atlantic, mostly to and from the spawning grounds. First maturity is reached at 4 years for males and 5 years for females, except in the North Sea stock where it is reached at 2 and 3 years respectively. Although the overall sex ratio is about 1: 1, females predominate in shallow waters and males on offshore grounds.

Fecundity ranges from 55 000 eggs for a 25 cm fish to 1 841 000 eggs for a 91 cm specimen. Spawning occurs in typically marine waters (35‰ salinity) between ca. 50 to 150 m depth, in the northwestern Atlantic from January to July (depending on the areas) and in the northeastern Atlantic from February to June (mostly in March-April). The eggs are pelagic and the larvae are believed to be pelagic for some 3 months. The growth rate varies considerably with regions, the length of the fish ranging from 17 to 19 cm at the end of the first year from 25 to 36 cm at 2 years, from 37 to 58 cm at 5 years, from 71 to 76 cm at 10 years, and from 75 to 82 at 13 years. Life expectancy is about 14 years.

The haddock is an omnivorous fish, feeding mainly on relatively small bottom-living organisms including crustaceans, molluscs, echinoderms, worms and fishes.

**Size** : Rarely exceeding 1 m total length.

**Interest to Fisheries** : An important target species in North Atlantic fisheries. The catch reported for 1987 in the FAO Yearbook of Fishery Statistics totalled 398 522 metric tons. Most of this catch (363 353 metric tons) was taken in the northeastern Atlantic (UK: ca. 119 000 t, USSR: ca. 78 000 t, Norway: ca. 75 000 t, Iceland, ca. 39 000 t, Faeroe Islands: ca. 17 000 t, France: ca. 12 000 t, Denmark: ca. 11 000 t, and others), and 35 169 metric tons in the northwestern Atlantic (Canada: ca. 29 000 t, USA: ca. 3 000 t, France: ca. 2 000 t, Spain: ca. 1 100 t, and others). The major fishing grounds are located off the European coasts of USSR, around Iceland, in the Barents Sea, around the Faeroe Islands, off western Norway and western Scotland, in the Celtic Sea, off Ireland, in the North Sea and in the English Channel.

The haddock is fished with bottom trawls, longlines, gillnets and traps. It is marketed fresh, chilled as fillets, frozen, smoked and canned; also processed to fish-meal and used for animal feeds.

**Local Names** : DENMARK: Kuller, Schellfisch; FRANCE : Ane, Anon, Bourricot, Calever, Eglefin, Habillot, Saint-Pierre; FINLAND : Kolja; GERMANY : Schellfisch; ICELAND : Ysa; ITALY : Asinello; NETHERLANDS: Schelviskuller; NORWAY: Hyse; POLAND : Lupacz, Plamcak; PORTUGAL : Bacalhau; SPAIN: Eglefino; SWEDEN : Kolja, Kalja; UK : Haddock; USSR : Piksha.

**Literature** : Svetovidov (1948); Bigelow & Schroeder (1953); Leim & Scott (1966); Blacker (1971).

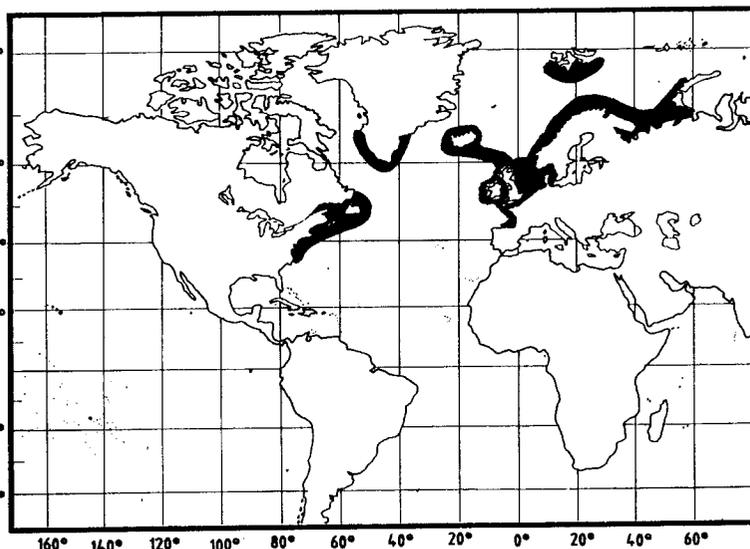


Fig. 102

**Merlangius**

**GADI Merla**

**Genus with Reference** : *Merlangius* E.L. Geoffroy, 1767, Descriptions, vertus et usages, etc.: 401

**Diagnostic Features** : See species.

**Remarks**: A single species divided into two subspecies by most authors.

***Merlangius merlangus*** (Linnaeus, 1758)

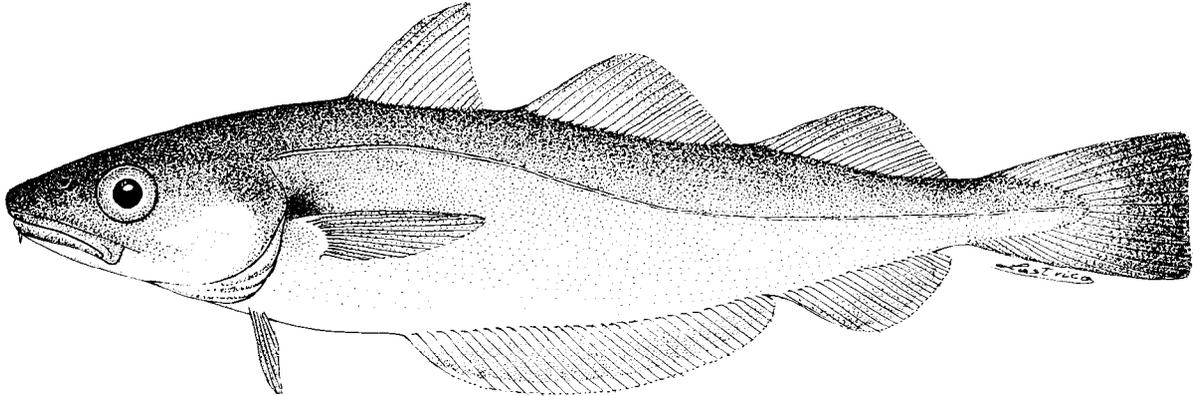
Fig. 103

GADI Merla 1

**Scientific Name with Reference** : *Gadus merlangus* Linnaeus, 1758, *Syst.Nat.*, ed.X:253.

**Synonyms** : *Merlangus vulgaris* Fleming, 1828; *Gadus euxinus* Nordmann, 1840; *Merlangus linnei* Malm, 1877; *Gadus merlangus merlangus*, Svetovidov, 1935; *Gadus merlangus euxinus*, Svetovidov, 1935; *Odontogadus merlangus merlangus*, Svetovidov, 1948; *Odontogadus merlangus euxinus*, Svetovidov, 1948; *Merlangius merlangus merlangus*, Bini, 1970; *Merlangius merlangus euxinus*, Bini, 1970.

**FAO Names** : En - Whiting; Fr - Merlan; Sp - Plegonero



(after Quéro, 1984)

Fig. 103

**Diagnostic Features** : Chin barbel absent or small. Upper jaw projecting slightly. Three dorsal fins separated by small spaces and two anal fins touching each other or nearly so; anterior anal fin base elongate, one-half or more of preanal distance; pectoral fin reaching well beyond origin of anal fin; pelvic fin with a slightly elongated ray. Lateral line continuous along its entire length. Lateral-line canals on head with pores. **Colour**: variable; often a small dark blotch at upper base of pectoral fin.

**Geographical Distribution** : Eastern North Atlantic from the southeastern Barents Sea and Iceland to Portugal, also in the Black Sea, Aegean Sea, Adriatic Sea and adjacent areas. Rare in the northwestern Mediterranean according to Bini, 1970 (Fig. 104).

**Habitat and Biology** : Benthopelagic at depths from 10 to 200 m, but more common from 30 to 100 m, mainly on mud and gravel bottoms, but also on sand and rock. The young are found in shallower waters, from 5 to 30 m depth. Whittings migrate only after the first year of life when they leave the nursery areas for the open sea. First maturity is attained at 3 or 4 years of age. The sex ratio averages 38.5% males and 61.5% females in the Irish Sea, and 32.2% and 67.8% respectively in the North Sea. Fecundity estimates range from 200 000 eggs in small females to over 1 million eggs in large individuals. Spawning occurs at 20 to 150 m depth, from January to September in the area between the British Isles and the Bay of Biscay, from January to spring in the Mediterranean, and throughout the year in the Black Sea. The eggs are

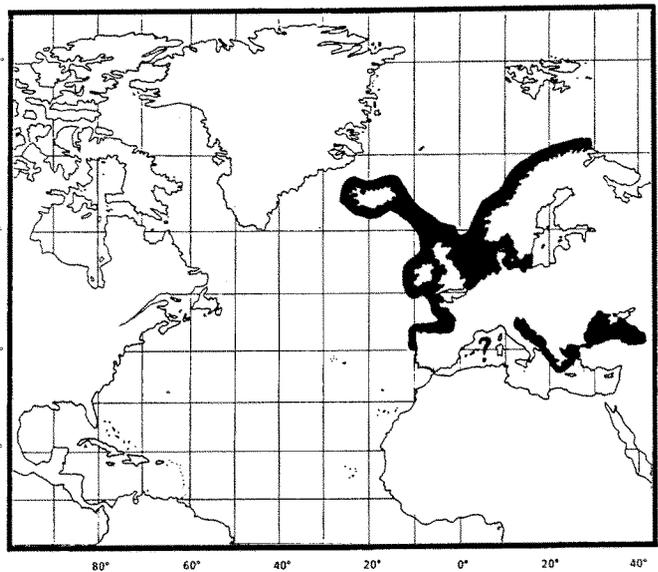


Fig. 104

pelagic, and the larvae and juveniles are associated with jellyfish, and do not become demersal until they reach 5 to 10 cm length. Growth is rapid; at one year of age, the size of fish ranges from 15 to 19 cm, at 2 years, from 22 to 25 cm, at 3 years, from 30 to 34 cm; females grow faster than males, life expectancy is about 10 years. The diet of adults includes shrimps, crabs, molluscs, small fish, polychaetes and cephalopods.

**Size** : Rarely reaching 70 cm; more common less than 23.50 cm.

**Interest to Fisheries** : A relatively common fish taken especially in European Atlantic waters. The catch for 1987 reported in the FAO Yearbook of Fishery Statistics totalled 152 608 metric tons, of which 119 701 metric tons were taken in the northeastern Atlantic (UK: ca. 59 000 t, France: ca. 33 000 t, Ireland: ca. 9 600 t, Netherlands: ca. 8 600 t, Denmark: ca. 3 000 t, and others) and 32 907 metric tons in the northwestern Atlantic (Turkey: 29 500 t, USSR: ca 2 800 t, and others).

Whiting are caught mostly by bottom trawls and longlines; also handlines and occasionally, purse seines are used. They are marketed fresh, as chilled fillets, frozen, and dried-salted. Also used as feed for the Black Sea-trout.

**Local Names** : ALGERIA: Murluts; BULGARIA: Medzid; DENMARK: Hvilling; FRANCE : Lécaud, Merlan, Merlana, Merlin, Merlu, Nasellu, Varlet (young); GERMANY : Wittling; GREECE: Taoúki; ISRAEL: Merlan; ITALY: Merlano, Molo; MAROC: Peskadil'ia MONACO: Merlan; NETHERLANDS: Wijting; POLAND: Witlinek; PORTUGAL : Badejo; ROMANIA: Bacaliar; SPAIN: Merlan, Plegonero; SWEDEN: Vitling; TUNISIA: Nazalli; TURKEY: Bakalyaro, Mezgit; USSR : Chernomorskiy merlang; UK: Whiting.

**Literature** : Svetovidov (1948); Nagabhushanam (1964); Garrod & Gambell (1965); Bini (1969); Fischer, Bauchot & Schneider, eds (1987).

**Remarks** : Whiting from the Black Sea and adjacent waters are treated as separate subspecies by most ichthyologists.

## Microgadus

## GADI Micro

**Genus with Reference** : *Microgadus* Gill, 1865, Proc.Acad.Nat.Sci.Philad., :69

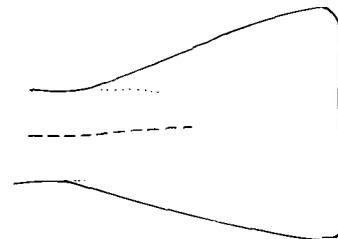
**Diagnostic Features** : Lower jaw shorter than upper. No palatine teeth. A short chin barbel present. Three dorsal and two anal fins, distinctly separate from each other; pectoral fin not reaching far beyond anal fin origin. Lateral line continuous to end of third dorsal fin, then interrupted to end of body. Lateral-line pores absent from head. Parapophyses not expanded at their tips.

**Habitat, Distribution and Biology** : Benthopelagic, mostly inshore, found along north temperate to boreal Coasts of northeast and northwest North America.

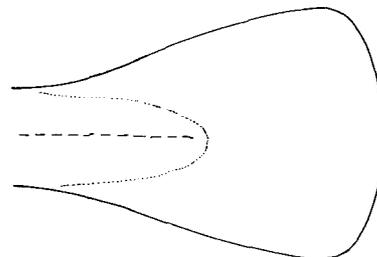
**Interest to Fisheries** : Of minor importance.

**Key to species** :

- 1a. Gill rakers on first arch 26 to 28. Caudal fin truncate (Fig. 105a) . . . . . ***M. proximus***
- 1b. Gill rakers on first arch 16 to 21. Caudal fin rounded (Fig. 105b) . . . . . ***M. tomcod***



a. *M. proximus*



b. *M. tomcod*

Caudal fin

Fig. 105

***Microgadus proximus*** (Girard, 1854)

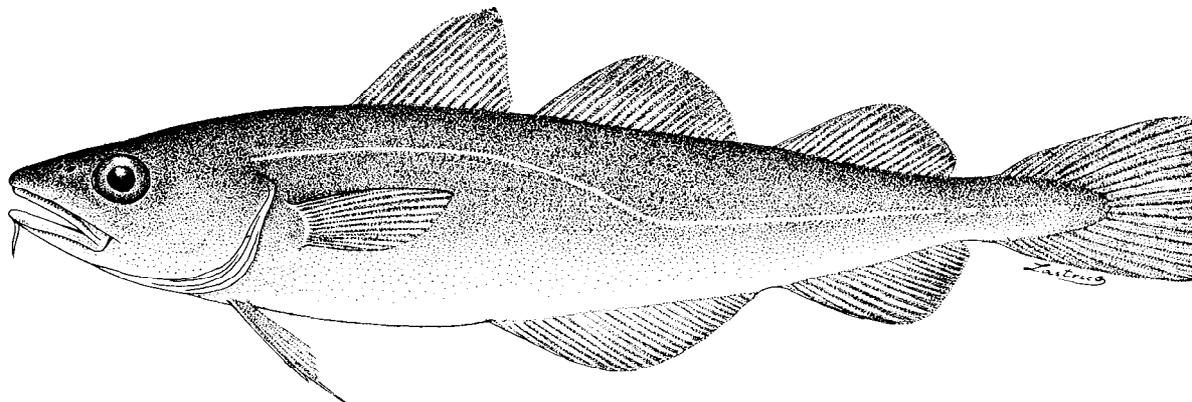
Fig. 106

GADI Micro 1

**Scientific Name with Reference** : *Gadus proximus* Girard, 1854, Proc.Acad.Nat.Sci.Philad., 1854: 141

**Synonyms** : *Morrhua californica* Ayres, 1857; *Morrhua proxima*, Girard, 1858; *Gadus californicus*, Günther, 1862.

**FAO Names** : En - Pacific tomcod; Fr - Poulamon du Pacifique.



(adapted from Svetovidov, 1948 and from Hart, 1973)

Fig. 106

**Diagnostic Features** : Gill rakers on first arch 26 to 28. Caudal fin truncate. **Colour**: olive green dorsally, pale ventrally; fins dusky marginally.

**Geographical Distribution** : Southeastern Bering Sea to Central California (Fig. 107).

**Habitat and Biology** : A demersal species generally found in 25 to 120 m depth over sand, but it may occur to depths of 260 m; may enter brackish water. Feeds mostly on shrimps, amphipods, isopods, gastropods, mussels and fish. Subject to copepod parasitism (inside the mouth).

**Size** : Reaches 30 cm.

**Interest to Fisheries** : No catch statistics are reported for this species. Of limited value, since not very abundant, but highly esteemed. Used fresh, occasionally trawled or taken on hook and line, especially by recreational fishermen.

**Local Names** : CANADA, USA : Pacific tomcod

**Literature** : Hart (1973).

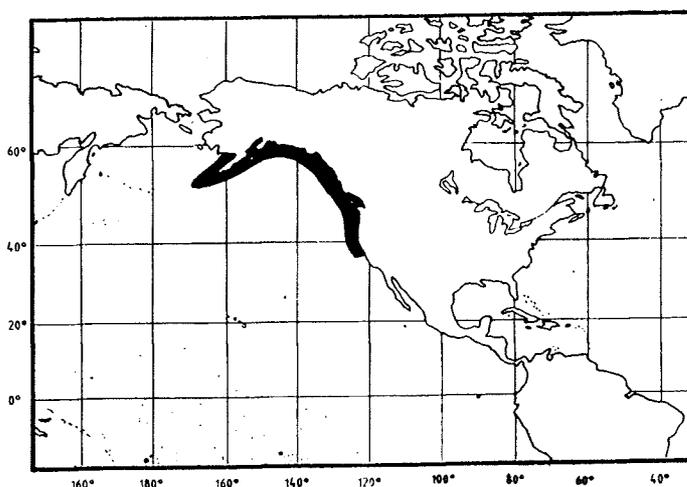


Fig. 107

***Microgadus tomcod*** (Walbaum, 1792)

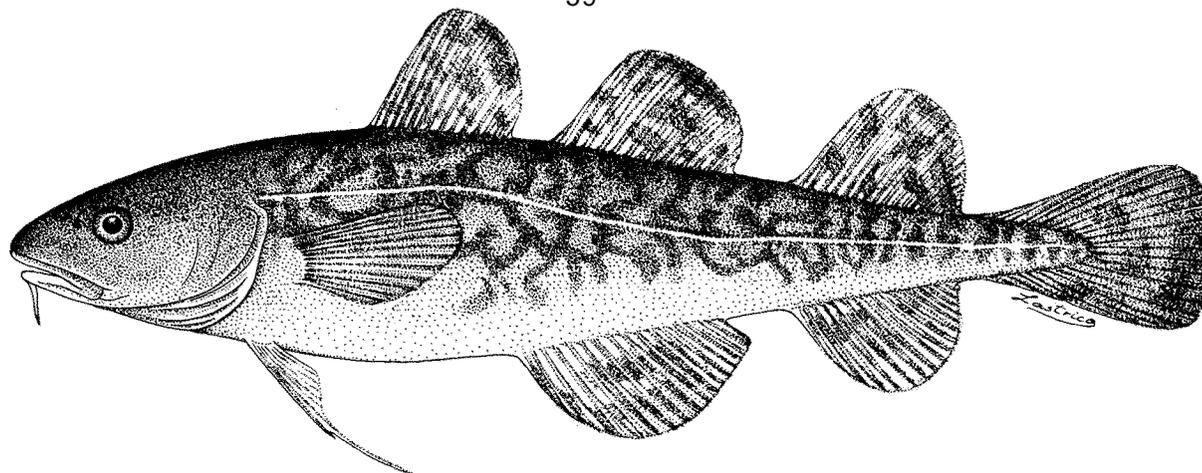
Fig. 108

GADI Micro 2

**Scientific Name with Reference** : *Gadus tomcod* Walbaum, 1792, in Artedi, Gen.Pisc.: 133.

**Synonyms** : *Gadus frost* Walbaum, 1792; *Gadus pruinus* Mitchill, 1815; *Gadus tomcod fuscus* Mitchill, 1815; *Gadus tomcod luteus* Mitchill, 1815; *Gadus tomcodus mixtus* Mitchill, 1815; *Gadus polymorphus* Mitchill, 1815; *Morrhua tomcodus*, Storer, 1839; *Morrhua pruinosa*, Storer, 1858.

**FAO Names** : En - Atlantic tomcod; Fr - Poulamon de l'Atlantique



(adapted from Bigelow & Schroeder, 1953 and from Scott & Crossman, 1973)

**Diagnostic Features** : Gill rakers on first arch 16 to 21. Pelvic fin with a slightly elongated filament. Caudal fin rounded. **Colour**: dorsally olive brown to green or yellow, paler ventrally; dark mottling on sides and fins.

**Geographical Distribution** : Southern Labrador to Virginia (Fig. 109).

**Habitat and Biology** : Demersal in coastal, brackish and fresh water, landlocked in several lakes. No inshore-offshore migrations, but moves from shore into deeper cooler waters in spring, and returns in autumn and winter (November to February) to estuaries and freshwater streams to spawn. The eggs tolerate a wide range of salinity and can develop equally well in freshwater and in salinities up to one-half that of ordinary sea water. Feeds mostly on small crustaceans (especially shrimps and amphipods; also on worms, small molluscs, squids and fish fry.

**Size** : Reaches 36 cm total length, but rarely exceeds 30 cm.

**Interest to Fisheries** : A popular sports and food fish, though of limited abundance. Landings reported in the FAO Yearbook of Fishery Statistics were 304 metric tons in 1978, 255 t in 1986 and only 10 t in 1987 (all Canada). Taken with bag nets, pocket nets, and weirs. In the past, hook and line and traps were also used. The major fishing grounds are in Massachusetts and New England. Often taken incidental to smelt, but not plentiful enough to support a regular commercial fishery.

**Local Names** : CANADA : Atlantic tomcod, Frostfish, Poulamon; USA : Atlantic tomcod, Frostfish.

**Literature** : Bigelow & Schroeder (1953); Scott & Crossman (1973).

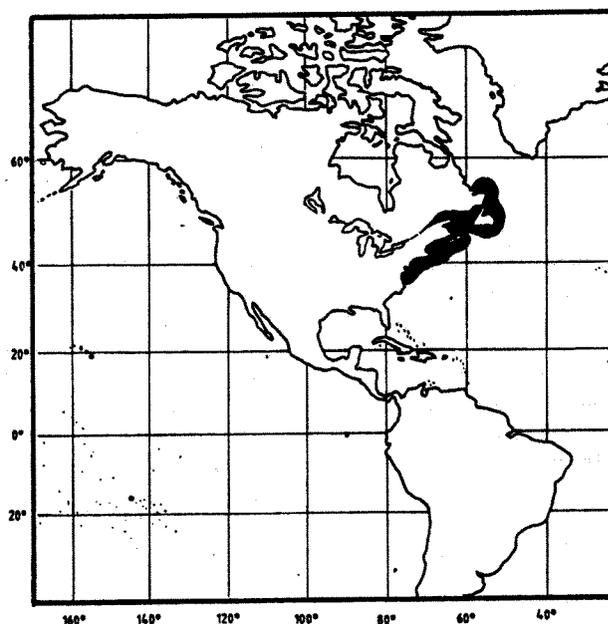


Fig. 109

**Micromesistius****GADI Microm**

**Genus with Reference** : *Micromesistius* Gill, 1826, Proc.Acad.Nat.Sci.Philad., :1863(1864):231-248.

**Diagnostic Features** : Lower jaw longer than upper; no barbel at tip of lower jaw. Three dorsal fins separated by long spaces and two anal fins, the anterior one long-based, extending from about beginning of first to beginning of third dorsal fin; pectoral fin reaching well beyond origin of anal fin; no elongated rays in pelvic fin. Lateral line continuous along entire length of body. Head with lateral-line pores.

**Habitat, Distribution and Biology** : Benthopelagic to pelagic in the southern Pacific and the southwestern Atlantic.

**Interest to Fisheries** : Important commercial fish.

**Key to species** :

1a. Gill rakers on first arch 38 to 48 ... *M. australis*  
(Fig. 110)

1b. Gill rakers on first arch 26 to 34 ... *M. poutassou*  
(Fig. 112)

**Micromesistius australis** Norman, 1937

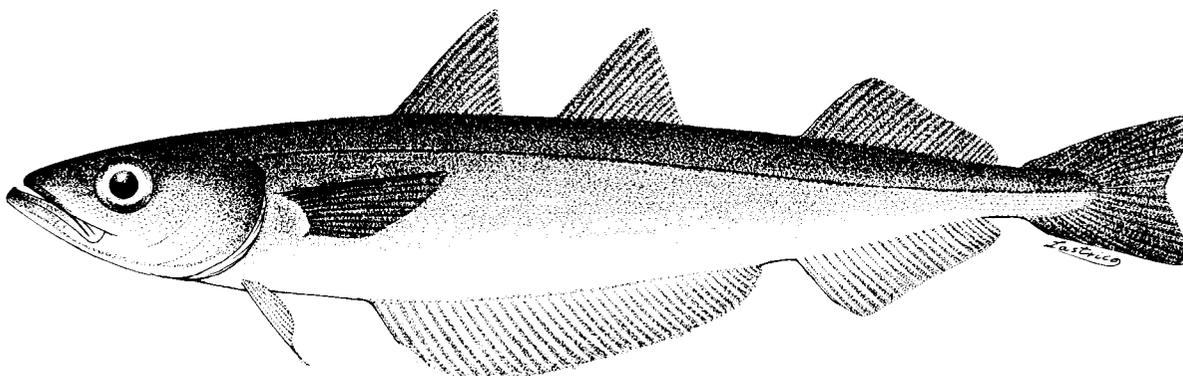
Fig. 110

**GADI Microm 2**

**Scientific Name with Reference** : *Micromesistius australis* Norman, 1937, Discovery Rept., 16: 51.

**Synonyms** : *Micromesistius australis australis*, Inada & Nakamura, 1975; *Micromesistius australis pallidus* Inada & Nakamura, 1975.

**FAO Names** : **En** - Southern blue whiting; **Fr** - Merlan bleu austral; **Sp** - Polaca.



(adapted from Norman, 1937 and from Inada, in Nakamura (ed.) 1986)

Fig. 110

**Diagnostic Features** : Gill rakers on first arch 38 to 48.

**Geographical Distribution** : There are two disjunct populations, one of which (*M. a. australis*) is found from about 38°S to nearly 62°S around the Falkland/Malvinas Islands and Argentine Patagonia in the western South Atlantic; also off South Georgia, South Shetland and South Orkney Islands and in the southeastern Pacific, off Chile; the other population (*M. a. pallidus*) lives on the various banks and rises around the South Island of New Zealand (Fig. 111).

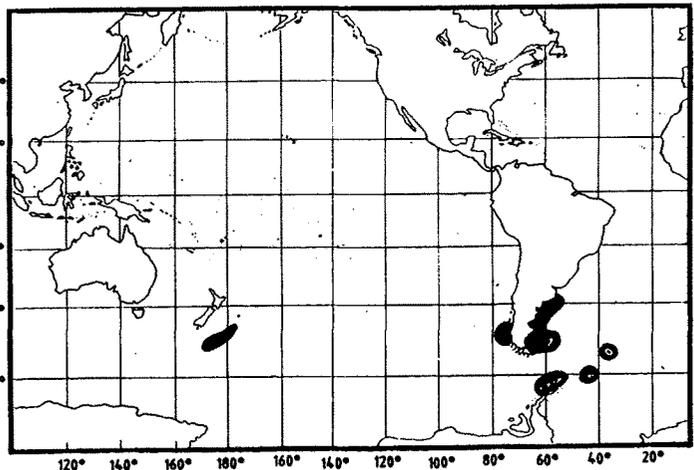


Fig. 111

**Habitat and Biology** : Benthopelagic to pelagic at depths of about 70 to 800 m, invading the shelf waters during summer and concentrating over the continental slope in winter. The New Zealand population is most abundant at 500 m (range: 180 to 800 m), the Argentine fishes at about 200 m (range: 70 to 620 m). In warm summers, the population of the Falkland/Malvinas current (on the Patagonian shelves of Argentina and southern Chile) migrates southward to S. Georgia, S. Shetland Islands, Elephant Island and the northern part of the Antarctic Peninsula. Up to 30 cm length, all fish are males, at 50 cm females and males are in the same proportion, and larger than 50 cm 90% are females. Spawning occurs from June to July in New Zealand and spring to early summer in Patagonia and the Falkland/Malvinas Islands. Growth rate differs by sex with females larger than males: 1 year = 13 cm; 2 years = 22 cm; 3 years = 29 cm; 10 years = 50 cm females and 47 cm males. The young feed on euphausiids and amphipods and occasionally on copepods, cephalopods, octopods and small fish.

**Size** : Reaching 90 cm total length, common to 60 cm.

**Interest to Fisheries** : Caught with mid-water and bottom trawls, mostly on the Patagonia/Fuegian shelf, off Argentina by Polish, Russian and Bulgarian vessels, and off the southern shelf of New Zealand by Russian vessels. Landings reported for 1987 in the FAO Yearbook of Fishery Statistics amounted to 103 777 metric tons, of which 84 794 t were taken off Argentina, 16 410 t off New Zealand, and 2 573 t off Chile. Also very abundant around Elephant and S Orkney Islands. Utilized mainly in frozen blocks and as fish meal.

**Local Names** : ARGENTINA: Polaca; CHILE: Merluza de tres aletas.

**Literature** : Lopez & Bellisio (1973); Inada & Nakamura (1975); Bellisio, Lopez & Tomo (1979), Inada (1986).

**Micromesistius poutassou** (Risso, 1826)

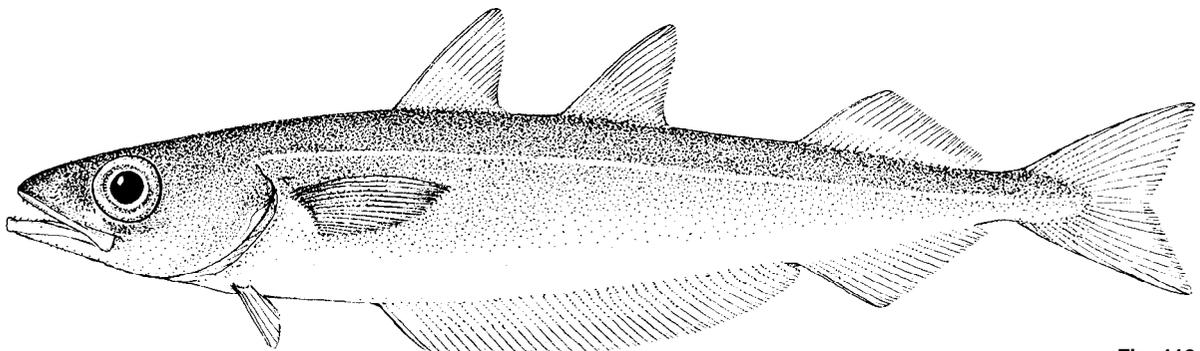
Fig. 112

GADI Microm 1

**Scientific Name with Reference** : *Merlangus poutassou* Risso, 1826, *Hist.Nat.Eur.Merid.*, 2:277.

**Synonyms** : *Merlangus vernalis* Risso, 1826; *Merlangus pertusis* Cocco, 1829; *Merlangus albus* Yarrell, 1841; *Merlangus communis* Costa, 1844; *Gadus potassoa* Düben & Koren, 1846; *Gadus melanostomus* Nilsson, 1855; *Boreogadus poutassou*, Malm, 1877; *Gadus poutassou*, Moreau, 1881.

**FAO Names** : En - Blue whiting; Fr - Merlan bleu; Sp - Bacaladilla.



(after Bini, 1969)

Fig. 112

**Diagnostic Features** : Total gill rakers on first arch 26 to 34. **Colour**: blue-grey on the back, paler on the sides, shading to white on the belly. Sometimes a small dark blotch at base of pectoral fin

**Geographical Distribution** : North Atlantic from the Barents Sea south through the eastern Norwegian Sea, around Iceland, through the eastern Atlantic, in the western Mediterranean, and south along the African coast to Cape Bojador. Also taken around southern Greenland and occasionally off southeast Canada and the northeastern coast of the USA (Fig. 113).

**Habitat and Biology** : Oceanic and benthopelagic over the continental slope and shelf from 150 to more than 1 000 m, but more common at 300-400 m. Migrates in summer, after spawning, to the North (Faeroes, E. Iceland and Norway) and back to the spawning areas in January-February. Also makes daily vertical migrations: surface waters at night and near the bottom during the day. Reaches its first maturity at 3 years of age. Sex ratio varies geographically: 35% males - 65 % females in Iceland; 46% males - 54% females in the Faeroes; 41% males - 59 % females in W. Scotland; 42% males - 58% females in the Tuscan archipelago.

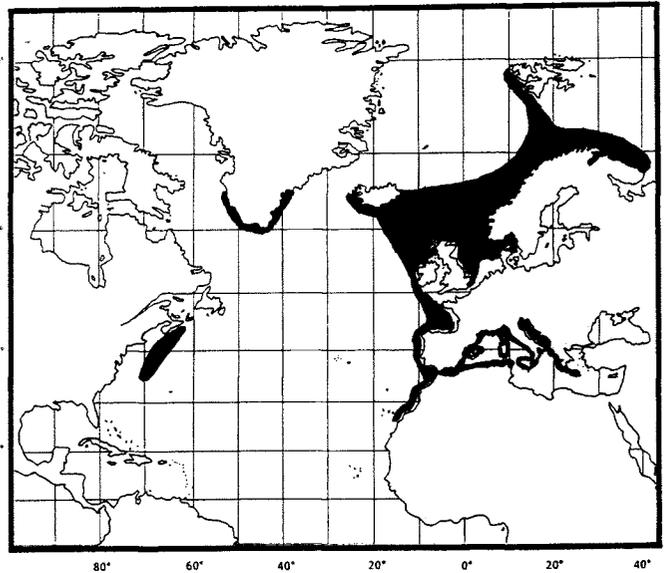


Fig. 113

From February to June, 6 000 to 150 000 eggs are laid, the major spawning grounds being the western. UK Islands, but also off Portugal, Bay of Biscay, Faeroes, Norway and Iceland, above the continental shelf. Growth is fast : 1 year = 16 cm; 5 years = 27 to 29 cm; 10 years = 29 to 34 cm. Females are usually larger than males. Maximum age is 20 years (45 cm). Feeds mostly on small crustaceans, but large individuals also prey on small fish and cephalopods.

**Size** : Reaching 50 cm total length; common from 15 to 30 cm.

**Interest to Fisheries** : The catch reported in the FAO Yearbook of Fisheries Statistics for 1987 was 708 000 metric tons, of which ca. 693 000 t were taken in the northeastern Atlantic (USSR: ca. 280 000 t, Norway: ca. 193 000 t, Faeroe Islands: ca. 86 000 t, Denmark: ca. 73 000 t, Spain: ca. 29 000 t, Netherlands: ca. 9 000 t, Portugal: ca. 9 000 t, and others), and 15 000 t in the Mediterranean (Spain: ca. 9 000 t, Italy: ca. 3 000 t, Greece: ca. 1 600 t, and others). It is suggested that a stock of several million tons of blue whiting exists in the northeastern Atlantic west of UK, and that the species could sustain an annual yield of over 1 000 000 metric tons (Buzeta & Nakken, 1974, Forbes, 1974).

The Blue whiting is caught mainly with trawls, longlines, trammel nets, gillnets, seines, lamparas and handlines, mostly beyond the edge of the continental shelf. It is marketed fresh and frozen, but a large part of the catch is processed industrially as oil and fishmeal, due to difficulties encountered in the conservation of the flesh, and to the high demand for fishmeal in the eastern European countries. However, considerable research is being conducted, especially in the UK, on new conservation technologies (fish blocks).

**Local Names** : ALBANIA: Lakuriq, Tripendesh; ALGERIA: Ferkh el bajj; BULGARIA: Putasu; CYPRUS: Gourlomata; DENMARK: Sortmund; EGYPT: Nazelli; FRANCE: Gros poutassou, Merlan bleu, Merlan de Paris, Nasellu; Patafloues, Poutassou, Tacaud; GERMANY: Blauer Wittling; GREECE: Prosfygaki; ISRAEL: Shibbut albin; ITALY: Melu, Potassolo; MALTA: Stokkafixx; MOROCCO: Abadekho; NETHERLANDS: Blawe wijting; NORWAY: Kolmule blagunnar; POLAND: Blekitek; PORTUGAL: Bacalhau, Pichelim; SPAIN: Bacaladilla; TUNISIA: Nazalli azraq; TURKEY: Bakayaro; UK: Bluewhiting; USSR: Putassu; YUGOSLAVIA: Pucinca, Ugotica.

**Literature** : Raitt (1968); Bini (1969); Buzeta & Nakken (1974); Forbes(1974)

**Molva****GADI Molv**

**Genus with Reference :** *Molva* LeSueur, 1819, Mem.Mus.Hist.Paris, 5:158.

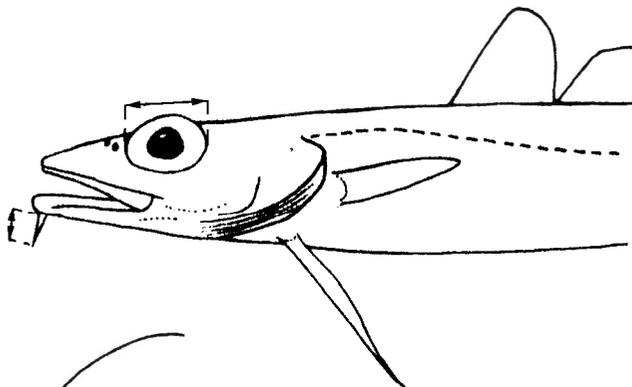
**Diagnostic Features :** Jaws with strongly developed teeth. No barbel-like flap on nostrils. Two dorsal fins and one anal fin, neither connected with caudal fin; first dorsal fin with 10 to 15 similar rays; pelvic fin without two greatly elongated rays; neither pectoral nor pelvic extend to beginning of anal fin. Lateral line continuous until end of dorsal and anal fin bases, interrupted beyond. Lateral-line canal on head with pores.

**Habitat, Distribution and Biology :** Demersal at depths of 150 to 1 000 m. Found in the North Atlantic and Mediterranean.

**Interest to Fisheries :** Fished commercially.

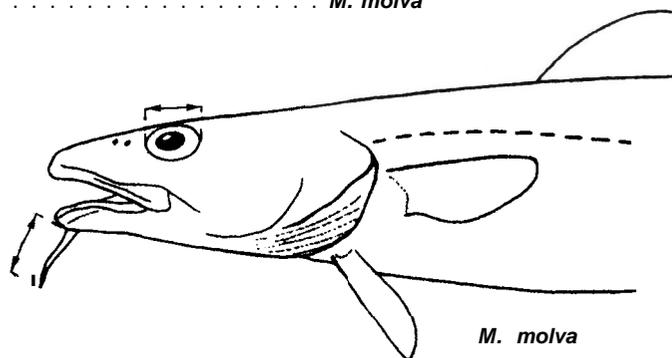
**Key to species:**

- 1a. Barbel shorter than eye (Fig. 114). Second dorsal fin rays 69 to 83. Anal fin rays 70 to 81 ..... *M.dypterygia*
- 1b. Barbel longer than eye (Fig. 115). Second dorsal fin rays 59 to 70. Anal fin rays 57 to 66 ..... *M. molva*



*M. dypterygia*

Fig. 114



*M. molva*

Fig. 115

***Molva dypterygia* (Pennant, 1784)**

Fig. 116

**GADI Molv 1**

**Scientific Name with Reference :** *Gadus dypterygius* Pennant, 1784, Arctic Zool., 1: 76.

**Synonyms :** *Gadus byrkelange* Walbaum, 1792; *Gadus abyssorum* Nilsson, 1832; *Molva abyssorum*, Nilsson, 1855; *Molva byrkelange*, Malm, 1877; *Molva dipterygia*, Smitt, 1893; *Molva dipterygia dipterygia*, Svetovidov, 1948.

**FAO Names :** En - Blue ling; Fr - Lingue bleue; Sp - Maruca azul.

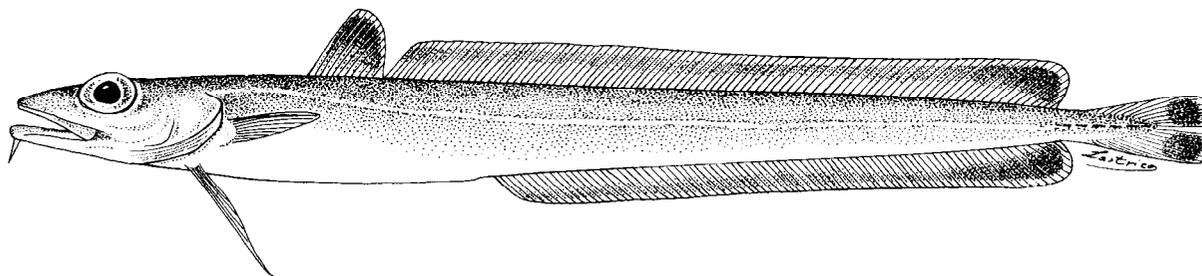


Fig. 116

**Diagnostic Features :** Lower jaw longer than upper; barbel shorter than eye. Second dorsal fin with 69 to 83 rays; anal fin with 70 to 81 rays; pelvic fin reaching beyond end of pectoral fin. **Colour:** dorsally grey to brown, shading to white ventrally. Posterior region of vertical fins dark with pale margins.

**Geographical Distribution** : Southwestern Barents Sea, sometimes north to Spitsbergen, west to Greenland and Newfoundland; southern coast of Iceland, around the British Isles and south to Morocco and into the Mediterranean (Fig. 117).

**Habitat and Biology** : Bottom-dwelling at depths from 150 to 1 000 m, mostly from 350 to 500 m, on muddy bottoms. The males reach first maturity at 9 years (75 cm), and the females at 11 years (88 cm). Spawns from April to May at 500 to 1 000 m depth from W. Scotland to Norway and from the Faeroes to S. Iceland; and from the end of winter to early spring at 500-600 m depth in the Mediterranean. Females grow faster than males: at 3 years, 40 cm; then 5-6 cm every year. Seventeen-year-old males reach 115 cm and 20 year-old females, 155 cm. Feeds on crustaceans and fish (flatfishes, gobies, rocklings).

**Size** : Reaches 155 cm total length.

**Interest to Fisheries** : Commercially fished with bottom trawls and longlines, especially in the north-eastern Atlantic. The catch reported for 1987 in the FAO Yearbook of Fishery Statistics totalled 27 365 metric tons, all from the northeastern Atlantic (France: ca. 13 300 t, Faeroe Islands: 7 000 t, Norway: ca. 4 490 t, and others). Also taken in industrial and artisanal fisheries in the Mediterranean. Marketed frozen and as fresh fillets (Mediterranean), but, also reduced to fish meal.

**Local Names** : ALGERIA: Lingue espagnole; BELGIUM: Blauwe leng; DENMARK : Byrkelange; FINLAND : Tylyppapystoinen molva; FRANCE : Lingue batarde, Lingue bleue, Lingue espagnole; GERMANY: Blauleng; GREECE: Glafkopontikopsaro; ICELAND: Blalanga; ITALY: Molva occhiona; MALTA: Linarda; NETHERLANDS: Blauwe leng; NORWAY: Blalange; POLAND: Molwa nibieska; SPAIN: Arbitan, Escolá; SWEDEN: Birkelanga blalange; UK: Blue Ling; USSR: Bolsheglazaya Mol'va.

**Literature** : Svetovidov (1948); Fraser-Brunner & Palmer (1951); Andriashev (1954); Fischer, Bauchot & Schneider, eds (1987).

**Remarks** : The northern form, scientific names for which are given above, grades into a southern population known variously as *M. dypterygia macrophthalmia*, *M. macrophthalmia*, *M. dipterygia elongata*, and *M. elongata*, which is of no interest to fisheries.

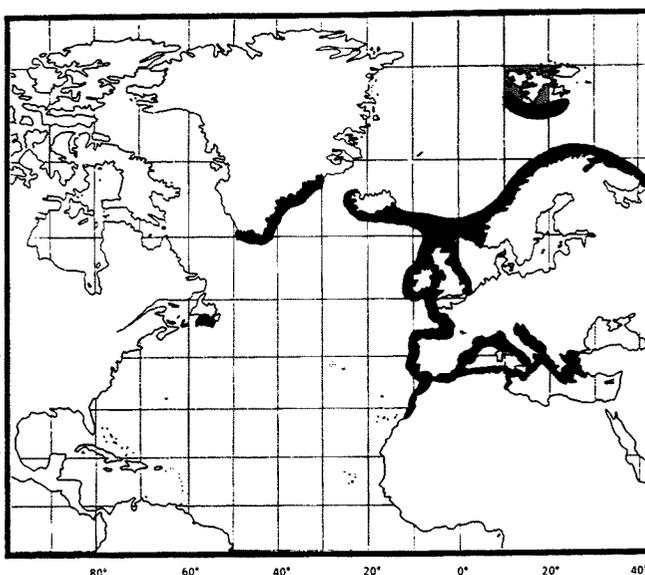


Fig. 117

**Molva molva** (Linnaeus, 1758)

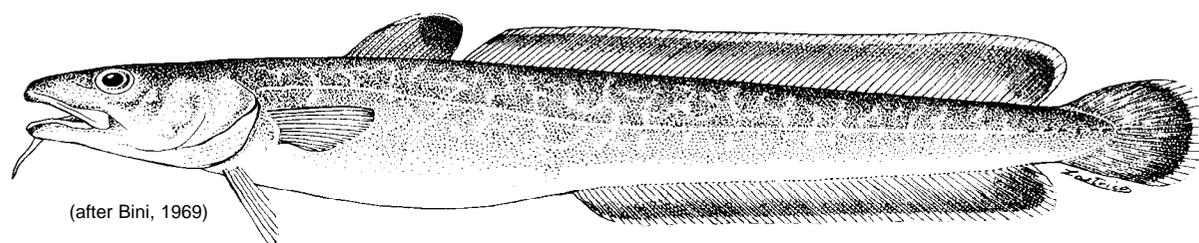
Fig. 118

GADI Molv 2

**Scientific Name with Reference** : *Gadus molva* Linnaeus, 1758, *Syst.Nat.*, ed. 10:254.

**Synonyms** : *Molva vulgaris* Fleming, 1828; *Gadus raptor* Nilsson, 1832; *Molva linnei* Malm, 1877; *Lota mola* Moreau, 1881; *Molva molva*, Smitt, 1893.

**FAO Names** : En - Ling; Fr - Grande lingue; Sp - Maruca.



(after Bini, 1969)

Fig. 118