

## 2.3

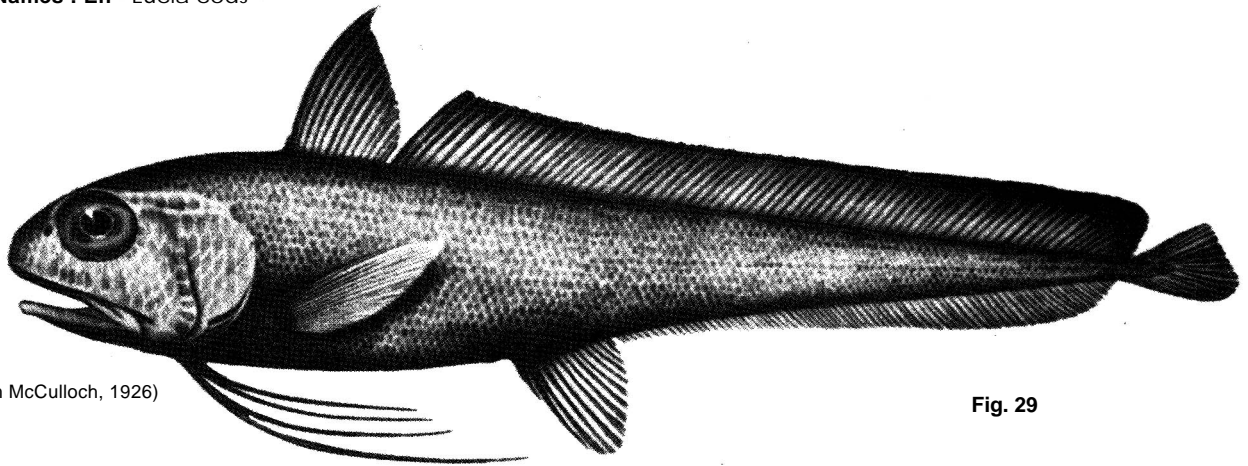
## FAMILY EUCLICHTHYIDAE

Fig. 29

EUCL

Family Name with Reference : *Euclichthyidae* Cohen, 1984b

FAO Names : En - Eucla cods



(from McCulloch, 1926)

Fig. 29

**General Features** : Body long and tapering. Mouth large, no chin barbel. Two nearly contiguous dorsal fins, the first short based and high, the second long-based, extending to base of caudal fin; anal fin long with a big anterior lobe followed by a long, low portion slightly increasing in height posteriorly and ending at base of caudal fin; pelvic fins with 4 long, completely separate filamentous rays, the longest reaching beyond the anus; caudal fin small, externally asymmetrical. **Colour** : body pale, with a black tinge on bottom of head, fore part of body, and around anus; tip of first dorsal, rear of second dorsal, and caudal with dark margins.

**Habitat, Distribution and Biology** : Benthic-pelagic off New Zealand and around Australia, from Queensland to the northwest shelf, in depths between 250 and 800 m.

**Interest to Fisheries** : Taken as by catch in trawls, but apparently not abundant. Size to about 35 cm.

**Literature** : McCulloch (1926); Ayling & Cox (1982); Last *et al.* (1983); Cohen (1984b); Paxton *et al.*, 1989.

**Remarks** : Recently established as a separate family by D. Cohen (1984b). It includes a single species *Euclichthys polynemus*.

## 2.4

## FAMILY GADIDAE

GADI

Family Name with Reference : Gadini Rafinesque, 1810, *Indice d'Ittologia Siciliana*, p. 11.

**General Features** : Gill openings extend upward above the level of pectoral fins. Anterior dorsal fin originating at rear of or behind head; caudal fin externally symmetrical. No V-shaped ridge on top of skull. Scales in most species overlapping and rounded, not set at right angles to each other. Swimbladder not connected to rear of skull. A single hypural bone attached to last vertebra. Spine on top of first vertebra is tightly connected to a narrow crest at the rear of the skull. Additional details are presented by Marshall & Cohen (1973), Fahay & Markle (1984), Dunn & Matarese (1984), and several authors *in* Cohen (1989).

**Habitat, Distribution and Biology** : Small to very large fishes, ranging in size from 15 cm (*Gadiculus argenteus*) to at least 200 cm in total length (*Gadus morhua*, *Molva molva*). They are found in circumpolar to temperate waters, mainly of the northern hemisphere. Most species are demersal or benthopelagic, only a few (i.e. *Arctogadus* and *Gadiculus* species) are predominantly pelagic. Gadids are typically marine fish, but a number of species (i.e. *Arctogadus borisovi*, *Boreogadus saida*, *Eleginus gracilis*, *Gadus morhua*, *Microgadus proximus* and *M. tomcod*) tolerate low salinities and hence also inhabit estuaries, and occasionally even freshwaters. One species, *Lota lota*, is restricted to circumpolar freshwater lakes and rivers. Very few species are confined to littoral or inshore waters (i.e. *Ciliata mustela*), some (i.e. *Eleginus* spp., *Merlangius merlangus*, *Microgadus* spp., *Pollachius* spp. and *Raniceps raninus*)

inhabit only shelf waters, but most extend to deeper waters on the slope beyond 500 m. Long-distance migrations are known for several gadid species (i.e. *Boreogadus saida*, *Gadus morhua*, *Gadus ogac* and *Melanogrammus aeglefinus*). Some species (i.e. *Theragra chalcogramma*) undertake diel vertical migrations, moving from the bottom to the surface at night. Schooling behaviour is well developed in certain species (i.e. *Gadus macrocephalus* and *G. morhua*).

**Interest to Fisheries :** The family Gadidae is second only to the Clupeidae in terms of the global volume of fish landings from marine waters. The global catch of gadid species recorded for 1987 in the FAO Yearbook of Fisheries Statistics totalled 11 674 333 metric tons, and separate statistics are given for 25 species (see Table I).

Table I

1987 landings of Gadidae reported to FAO

English Name	Latin Name	Landings in thousands of metric tons (1987)	Fishing Areas*
Alaska pollack	<i>Theragra chalcogramma</i>	6 703 868	61,67
Atlantic cod	<i>Gadus morhua</i>	2 054 721	27, 21
Blue whiting	<i>Micromesistius poutassou</i>	707 955	27, 37
Saithe (= Pollack)	<i>Pollachius virens</i>	475 981	27, 21
Pacific cod	<i>Gadus macrocephalus</i>	441 107	61, 67
Haddock	<i>Melanogrammus aeglefinus</i>	398 522	27, 21
Norway pout	<i>Trisopterus esmarkii</i>	321 082	27
Whiting	<i>Merlangius merlangus</i>	152 608	27, 37
Southern blue whiting	<i>Micromesistius australis</i>	103 777	41, 81, 87
Ling	<i>Molva molva</i>	58 124	27
Tusk	<i>Brosme brosme</i>	46 254	27, 21
White hake	<i>Urophycis tenuis</i>	30 429	21
Saffron cod	<i>Eleginus gracilis</i>	27 929	61
Blue-ling	<i>Molva dypterygia</i>	27 365	27
Pouting (= Bib)	<i>Trisopterus luscus</i>	22 664	27, 37, 34
Pollock	<i>Pollachius pollachius</i>	17 898	27
Polar cod	<i>Boreogadus saida</i>	11 713	61, 27
Greenland cod	<i>Gadus ogac</i>	4 017	21
Wachna cod (= Navaga)	<i>Eleginus navaga</i>	3 765	27
Red hake	<i>Urophycis chuss</i>	2 626	21
Greater forkbeard	<i>Phycis blennoides</i>	1 612	27, 37, 34
Burbot	<i>Lota lota</i>	1 577	freshwater
Brazilian codling	<i>Urophycis brasiliensis</i>	1 266	41
Poor cod	<i>Trisopterus minutus</i>	935	37
Atlantic tomcod	<i>Microgadus tomcod</i>	10	21
		<b>TOTAL</b> 10 917 468	

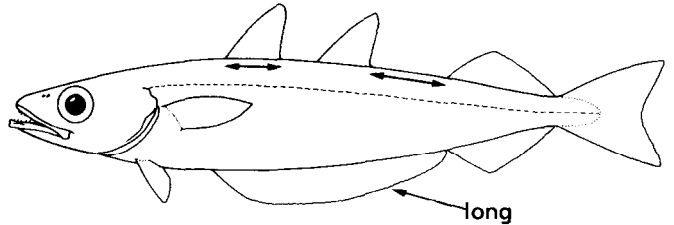
As shown in the above table, most of these landings provene from the traditional cold-water trawl fisheries of the northern hemisphere.

\* See map of fishing areas on page 398

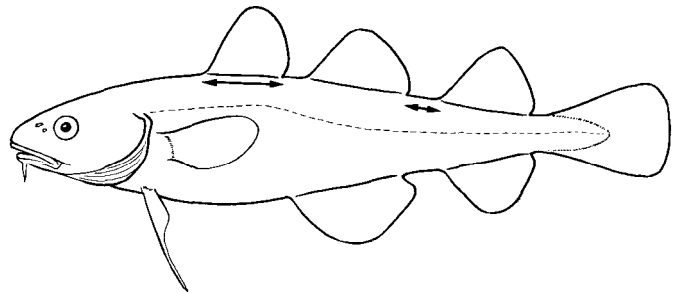
**Remarks :** The family has been revised by Svetovidov (1948) but our knowledge of this important group is still far from completed. It also included genera now placed in Moridae and Merlucciidae until the work of Svetovidov (1937), which has been followed by most ichthyologists. Several different classifications have been discussed in Cohen (1989). For the purposes of the present publication, only the following genera are here included in Gadidae: *Arctogadus*, *Boreogadus*, *Brosme*, *Ciliata*, *Eleginus*, *Enchelyopus*, *Gadiculus*, *Gadus*, *Gaidropsarus*, *Lota*, *Melanogrammus*, *Merlangius*, *Microgadus*, *Micromesistius*, *Molva*, *Phycis*, *Pollachius*, *Raniceps*, *Theragra*, *Trisopterus*, and *Urophycis*.

**Key to Genera:**

- 1a. Anal fins 2. Dorsal fins 3, the last one originating far posterior to the level of the vent
- 2a. First anal fin base very long, one-half or more of preanal distance
- 3a. Dorsal fins widely separated, space between second dorsal and third dorsal greater than length of base of first dorsal ..... **Micromesistius** (Fig. 30)
- 3b. Dorsal fins closer together, space between second dorsal and third dorsal less than length of base of first dorsal
- 4a. Lateral-line pores on head absent; although small papillae or pits may be present. **Microgadus\*** (Fig. 31)
- 4b. Lateral-line pores present on head (Fig. 32)
- 5a. Pelvic fin with no elongated ray (Fig. 33) ..... **Pollachius**
- 5b. Pelvic fin with a slightly elongated ray
- 6a. Chin barbel well developed.....**Trisopterus** (Fig. 34)



**Micromesistius** Fig. 30



**Microgadus** Fig. 31

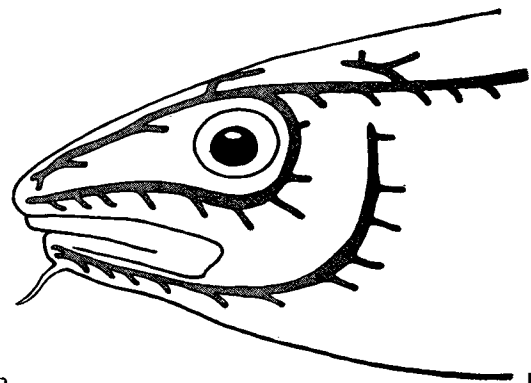
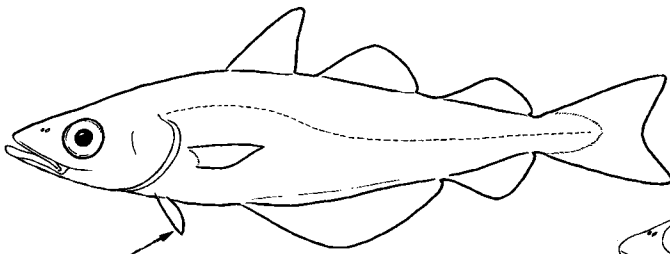
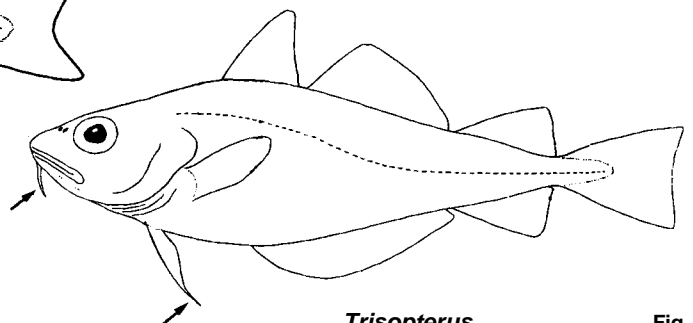


Fig. 32



**Pollachius** Fig. 33



**Trisopterus** Fig. 34

\* Entered twice in key, under 4a and 11 b

6b. Chin barbel absent or small.... **Merlangius**  
(Fig. 35)

2b. First anal fin base short, less than one-half of pre-anal length

7a. Eye large, greater than snout length. Mouth strongly oblique.....**Gadiculus**  
(Fig. 36)

7b. Eye smaller, less than snout length. Mouth generally horizontal to moderately oblique

8a. No lateral line pores on head; although small papillae or pits may be present

9a. Lateral-line interrupted along its entire length on side of body (Figs 37, 38)

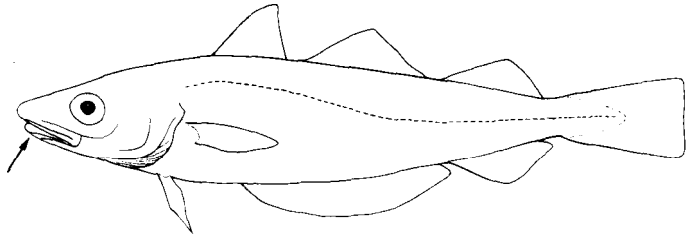
10a. Scales overlapping. Palatine teeth (on roof of mouth) sometimes present..... **Arctogadus**  
(Fig. 37)

10b Scales very small, embedded and non overlapping. Palatine teeth never present ..... **Boreogadus**  
(Fig. 38)

9b. Lateral line continuous along all or part of its length (Fig. 39)

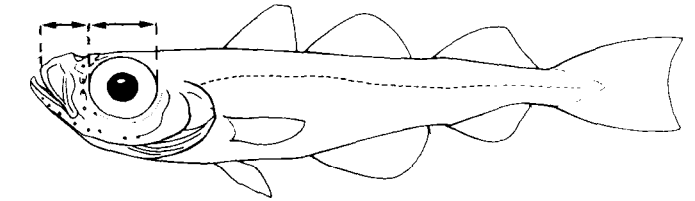
11a. Lateral line continuous to origin of second dorsal fin. Parapophyses expanded at their tips (Fig. 40a)..... **Eleginus**  
(Fig. 39)

11b. Lateral line continuous to end of third dorsal fin. Parapophyses not expanded at their tips (Fig. 40b)... **Microgadus**  
(Fig. 31)



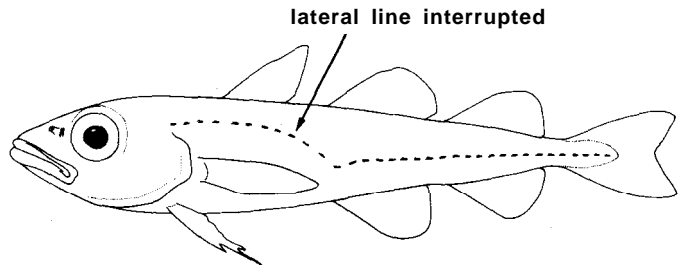
**Merlangius**

**Fig.35**



**Gadiculus**

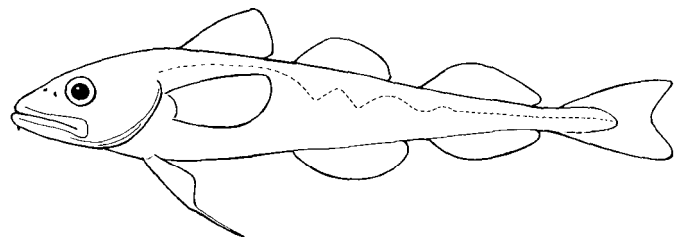
**Fig. 36**



lateral line interrupted

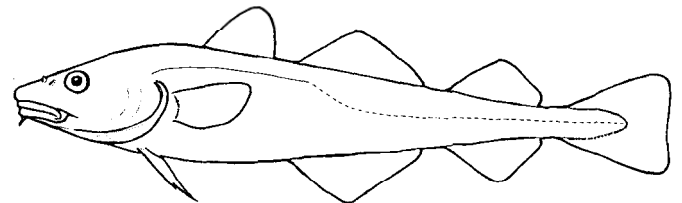
**Arctogadus**

**Fig. 37**



**Boreogadus**

**Fig. 38**



**Eleginus**

**Fig. 39**



a) **Eleginus**



b) **Microgadus**

parapophyses of pre-caudal vertebrae

vertebral column

**Fig.40**

8b. Lateral line pores present on head

12a. Lower jaw longer than upper ..... **Theragra**  
(Fig. 41)

12b. Upper jaw longer than lower

13a. A large dark blotch above pectoral fin. Lateral line dark, continuous to end of body..... **Melanogrammus**  
(Fig. 42)

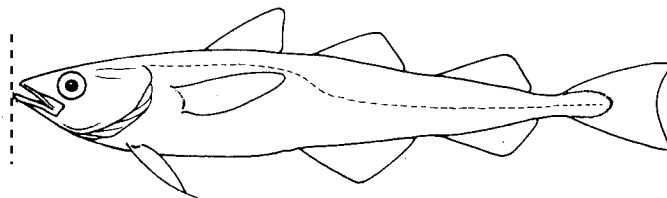
13b. No dark blotch above pectoral fin. Lateral line pale, interrupted posteriorly (Fig. 43) ..... **Gadus**

1 b. Anal fin one. Dorsal fins one or more, the last one (sometimes the only one) originating ahead of the level of the vent

14a. First dorsal ray followed by a row of small, fleshy filaments (Fig. 44)

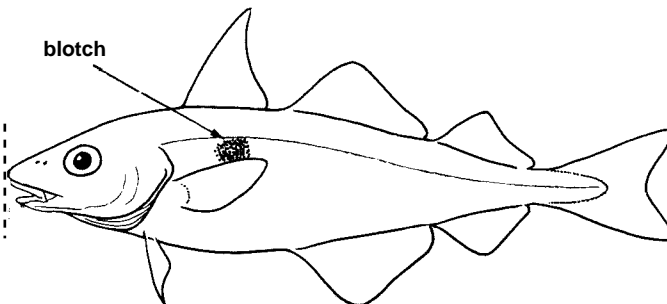
15a. Barbels on snout 2 (Fig. 46a)..... **Gaidropsarus**  
(Fig. 45)

15b. Barbels on snout three or more



**Theragra**

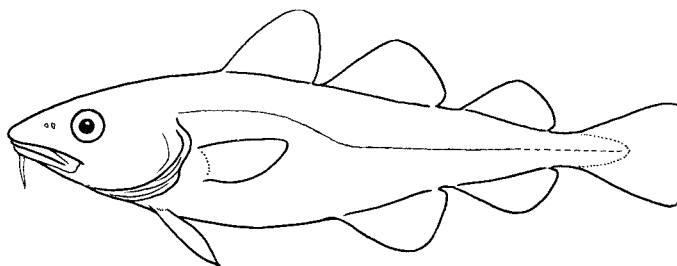
**Fig. 41**



blotch

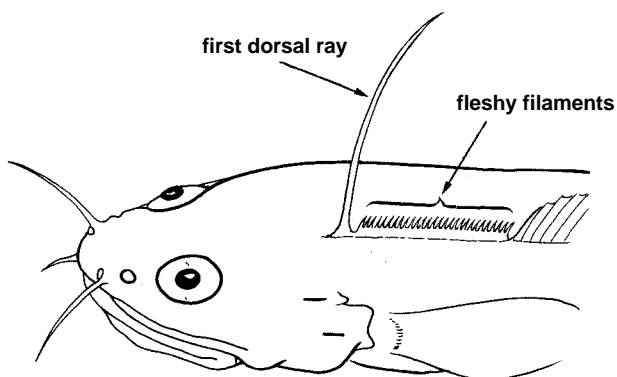
**Melanogrammus**

**Fig. 42**



**Gadus**

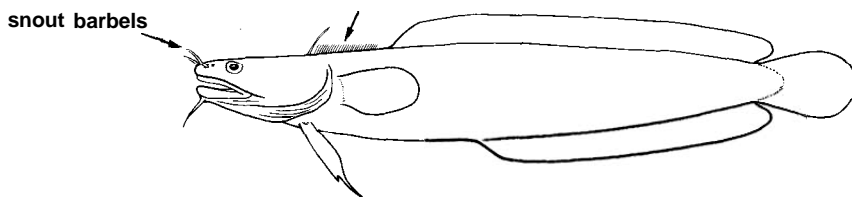
**Fig. 43**



first dorsal ray

fleshy filaments

**Fig. 44**



snout barbels

**Gaidropsarus**

**Fig. 45**

16a Barbels on snout 3 (Fig 46b).... **Enchelyopus**  
(Fig. 47)

16b. Barbels on snout 4 or more (Fig. 46c).. **Ciliata**  
(Fig. 48)

14b. First dorsal ray not followed by a row of small, fleshy filaments

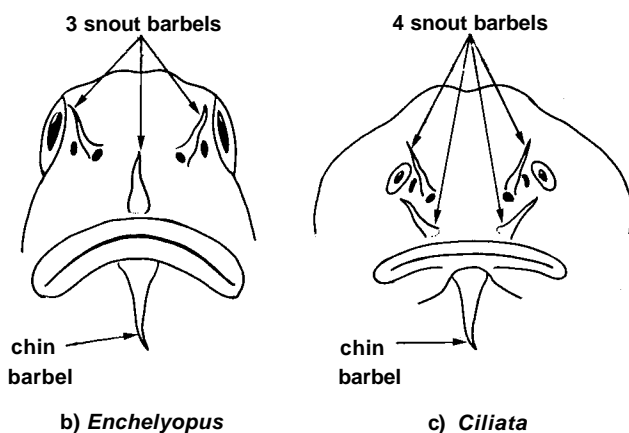
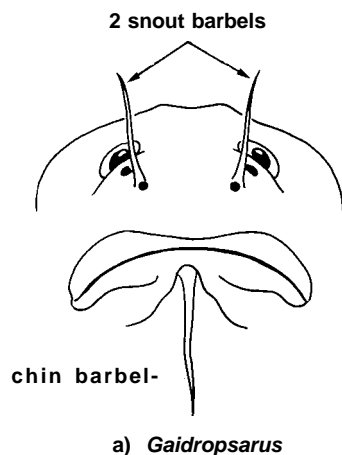
17a. Dorsal fin one ..... **Brosme**  
(Fig. 49)

17b. Dorsal fins two

18a. First dorsal fin poorly developed, with three short rays (sometimes only one easily visible). Head notably depressed..... **Raniceps**  
(Fig. 50)

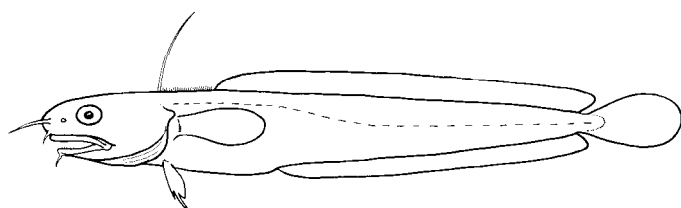
18b. First dorsal fin well developed, with eight or more rays

19a. Pelvic fin with two greatly elongated rays, extending beyond the tip of the pectoral fin and in many species beyond the beginning of the anal fin



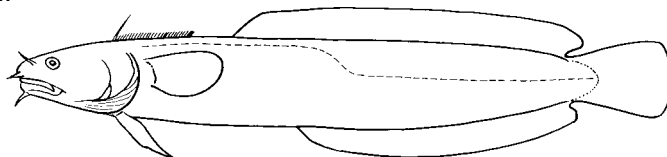
Front views of head

Fig: 46



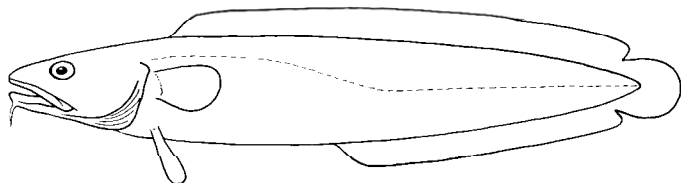
*Enchelyopus*

Fig. 47



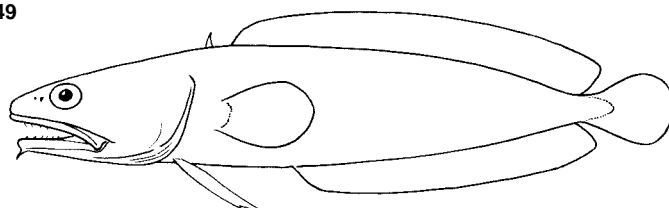
*Ciliata*

Fig. 48



*Brosme*

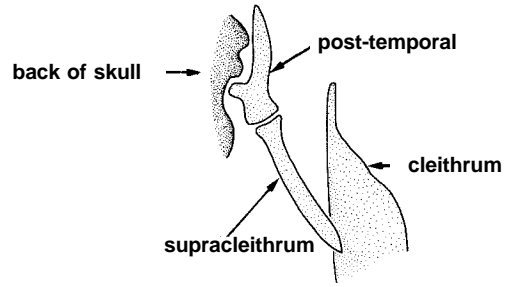
Fig. 49



*Raniceps*

Fig. 50

20a. Two well-developed bones (post temporal and supracleithrum) at top, front edge of shoulder girdle, loosely attached to back of skull and cleithrum (Fig. 51) ..... **Phycis** (Fig. 52)

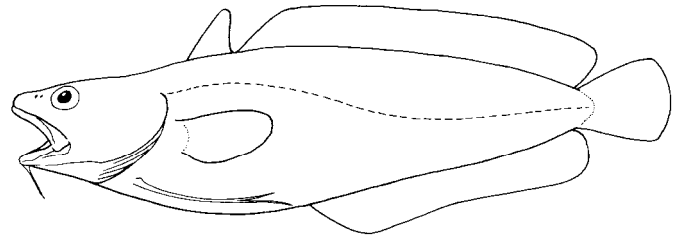


**Phycis (pectoral girdle)** Fig. 51

20b. Bones between back of skull and cleithrum very small or lacking..... **Urophycis** (Fig. 53)

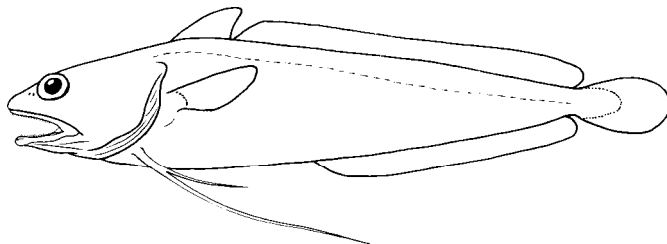
19b. Pelvic fin without two greatly elongate rays; tip of fin falling short of end of pectoral fin

21a. Anterior nostril with a prominent fleshy flap. No lateral line pores on head. Teeth all small and brushlike ..... **Lota** (Fig. 54)

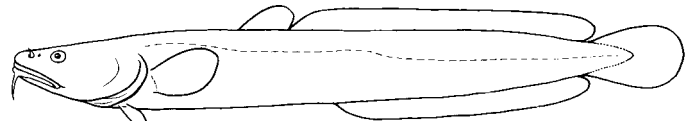
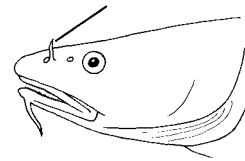


**Phycis** Fig. 52

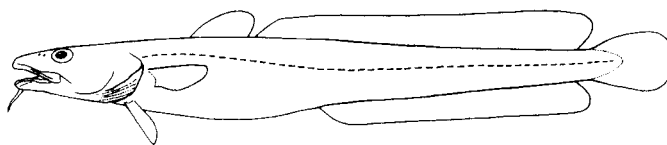
21b. Anterior nostril lacking fleshy tentacle. Lateral line pores present on head. Some teeth large and prominent ..... **Molva** (Fig. 55)



**Urophycis** Fig. 53



**Lota** Fig. 54



**Molva** Fig. 55