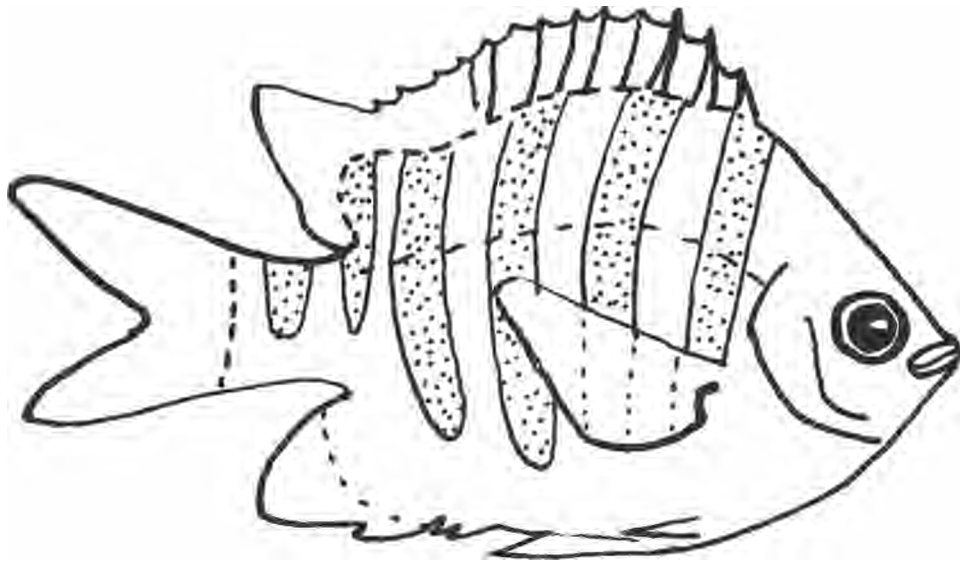


KEY TO THE FAMILIES OF THE INSHORE TELEOSTS
OF THE UPPER GULF OF CALIFORNIA

By
Donald A. Thomson
and
William H. Eger



July, 1964

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University of Arizona

INTRODUCTION

According to recent estimates (Walker, 1960) 120 families of fishes, consisting of at least 586 species, are represented in the Gulf of California. Of these, 60 species in about 10 families are deep-water fishes, leaving a total of 526 species frequenting the area of the continental shelf. Excluding the deep-water fishes, the offshore pelagic fishes, and the 16 families of elasmobranchs, we have constructed a provisional key to 66 selected families, of which representative species are likely to be encountered in the shallow waters of the Gulf between Guaymas and Puerto Periasco, Sonora, Mexico.

This key was modified from a key to the families of Hawaiian fishes and many of the line drawings are from the same source (Gosline, W.A. and V.E. Brock. 1960. Handbook of Hawaii Fishes. University of Hawaii Press. Honolulu, Hawaii. 372 pp.). Since we did not have access to any of the extensive fish collections made in the Gulf we were unable to test the key thoroughly with specimens. Our choice of families and key characters was guided by the provisional check list of Gulf fishes compiled by Walker and Norris (MS). We thank these authors for making this valuable list available to us.

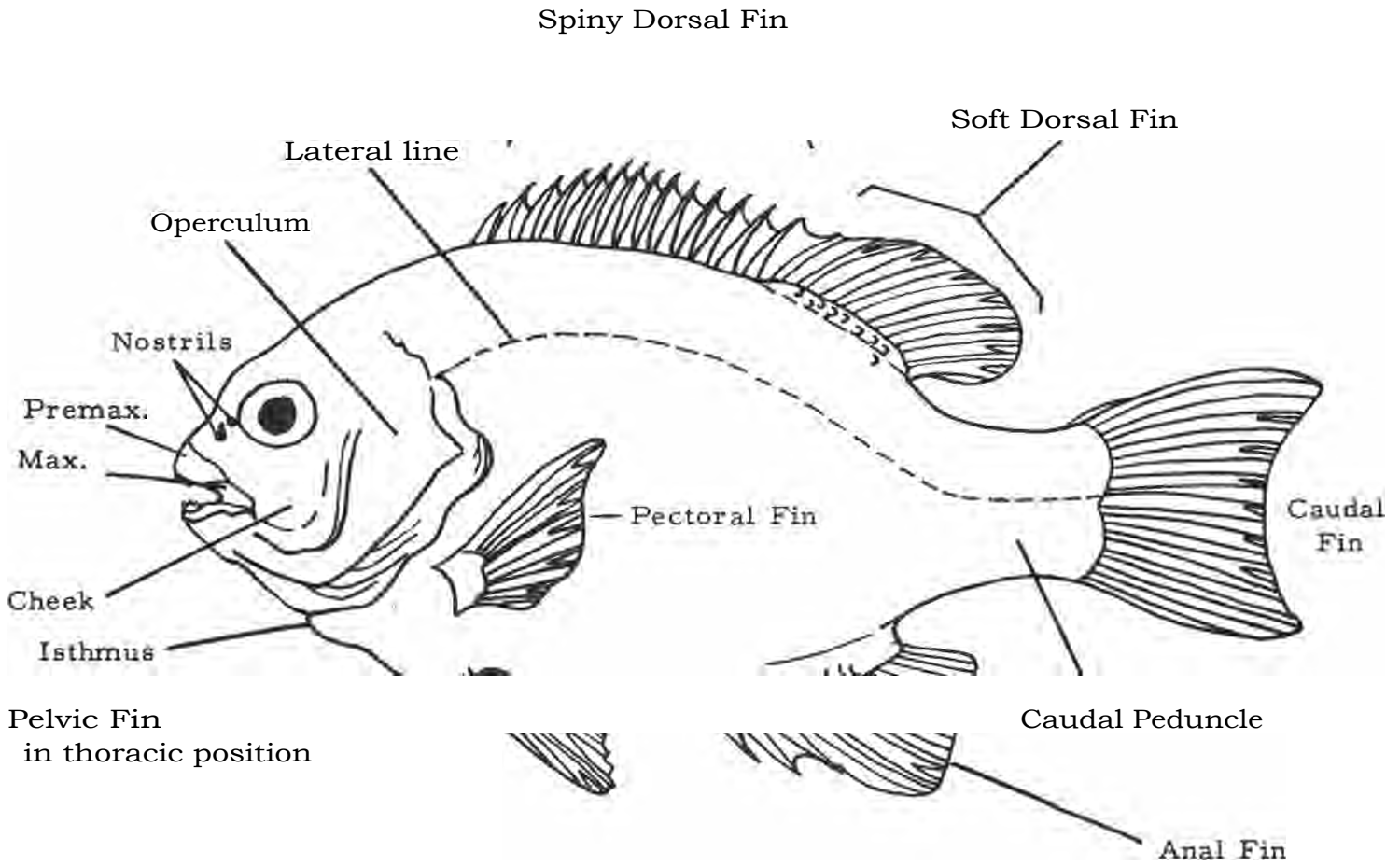
The line drawings were compiled and redrawn from several sources. Although representative Gulf species of each family were used whenever possible, in many cases we had to use representative genera when illustrations or specimens of properly identified species were unavailable. English and Mexican vernacular names respectively have been included below each drawing whenever possible.

It should be emphasized that this is a "working key" and it does not pretend to be anything else. Students are encouraged to report apparent errors or inconsistencies which they may discover as they "run" their specimens through the key.

MASTER KEY TO GROUPS OF FAMILIES

- I. Pelvic fins usually abdominal with more than 5 soft rays..... SUBKEY A, p. 3
- Pelvic fins usually thoracic or jugular with 5 or less soft rays..... II
- Pelvic fins totally absent SUBKEY D, p. 23
- II. Dorsal fin composed of 2 or more separate parts not connected by a basal membrane SUBKEY B, p. 7
- Dorsal fin continuous, or if subdivided, connected by a thin basal membrane SUBKEY C, p. 14

BASIC EXTERNAL ANATOMY OF A SPINY-RAYED FISH



The opal eye, Girella simplicans

SUBKEY A

(P 0 5 0 0 0 0 0 0 0 0)

N 0

0 0 0 0 0 0 0 0

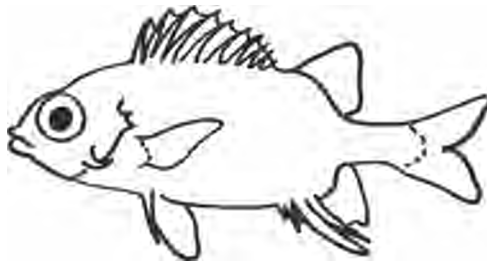
2

O 0

0 0 0 0 0 0 0 0

HOLOCENTRIDAE

(S 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0)



H 0 0 0 0 0 0 0 0 0 0 0 0 0 .

(S 0 0 0 0 0 0 0 0 0 0 0 0)

2(1) A 0

A 0

3

5

3(2) S 0

S 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 4-6 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

4

ARIIDAE

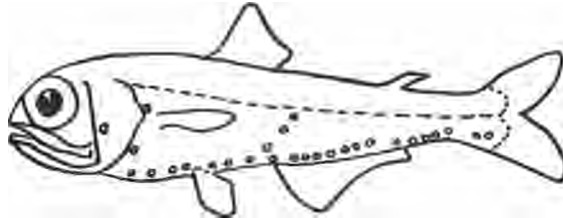
(M 0 0 0 0 0 C 0 0 0 0 0 0 0 0 0)



B 0 0 0 0 0 0 0 .

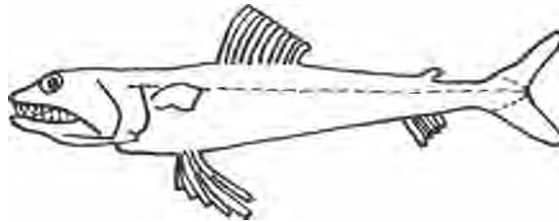
(M 0 0 0 0 0 C 0 0 0 0 0 0 , B 0 0 0 0 0 0 0 0 0 0 0 0)

- 4(3) Teeth poorly developed; photophores present along abdomen MYCTOPHIDAE
(Lantern fishes)



Myctophum sp.
(Lantern fish)

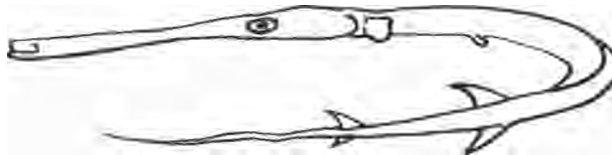
- Teeth well developed; no photophores; reptile-like head..... SYNODIDAE
(Lizard fishes)



Synodus sp.
(Lizard fish)

- 5(2) Snout not in the form of an elongate tube with a small mouth at the end..... 6

- Snout in the form of an elongate tube with a small mouth at the end FISTULARIIDAE
(Coronet fishes)



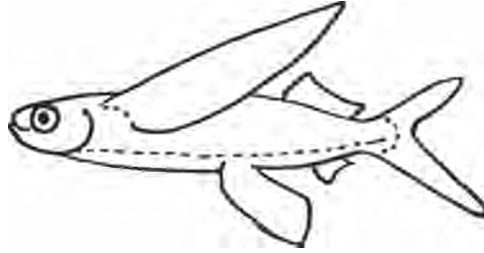
Fistularia petimba
(Coronet fish, Coroneta)

- 6(5) Pectorals not wing-like

P0 0000 0000 0000 -0000 ■■■■■

EXOCOETIDAE

(F00000000000)



C0000000000000

(F0000000000, P0000000000)

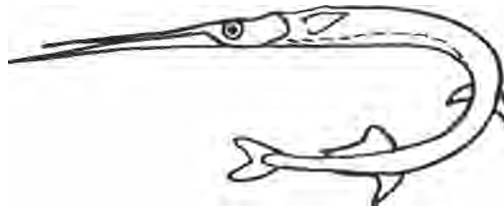
7(6) [] O0000000000000000000000000000 ■■■■■

8
9

J0000000000000000000000000000 ■■■■■

8(7) [] B0000000000000000000000000000 ... **BELONIDAE**

(N00000000000)



B00000000

(N000000000, Agujón)

O0000000000000000000000000000 ... **HEMIRAMPHIDAE**

(H00000000)



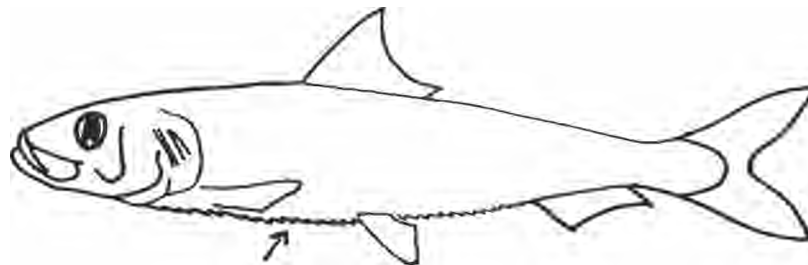
H000000000000000

(H0000000)

9(7) [] B0000000000000000000000000000 ■■■■■

B0000000000000000000000000000 ■■■■■

10
CLUPEIDAE
(H0000000)



S0000000000000000

(P00000S000000, S000000)

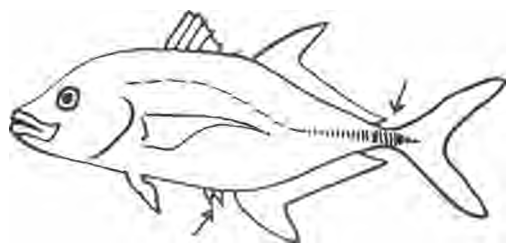
10(9) [] M0000000000,0000000000000000000000000000 ■■■■■

11

M000000000,0000000000000000000000000000 ■■■■■

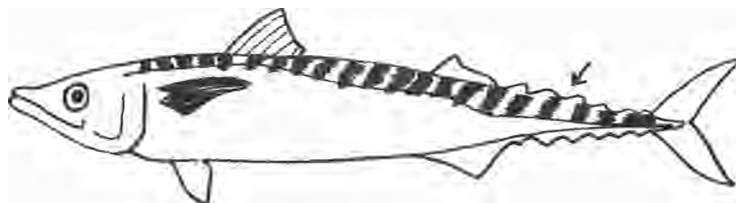
12

5(4) A 2 **CARANGIDAE**
 (J)



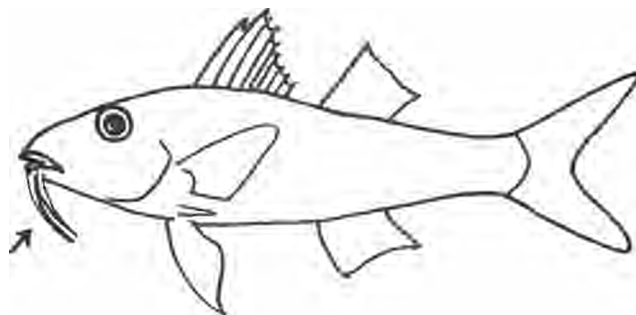
C
(J, C)

A 2 **SCOMBRIDAE**
 (M &)



P
(P M)

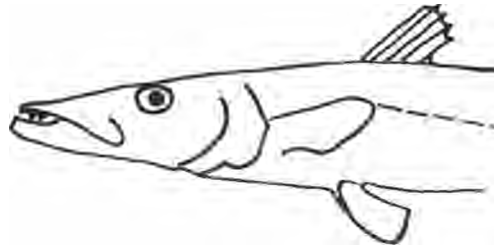
6(4) N **MULLIDAE**
 (G)



P
(G)

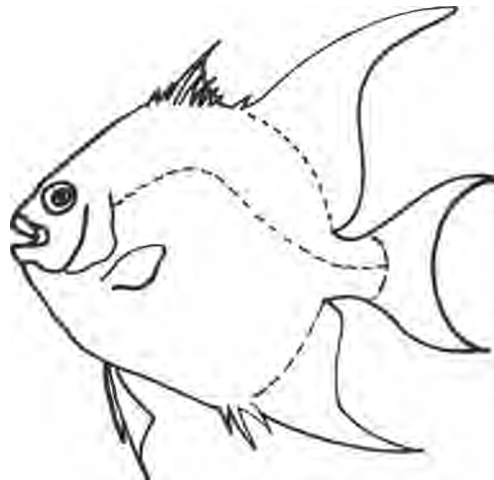
7(6) G **8**
 17

- 8(7) Mouth small or only moderately large; no strong canines on jaw or palate 9
- Mouth very large with prominent strong canines on jaw and palate SPHYRAENIDAE (Barracudas)



Sphyraena barracuda
Great Barracuda

- 9(8) Eyes lateral; no large spines above pectorals and behind opercles 10
- Eyes dorsal; 2 large spines above pectorals and behind opercles 19
- 10(9) Body elongated or only moderately compressed 11
- Body deeply compressed; mouth very small EPHIPPIDAE (Spadefishes)



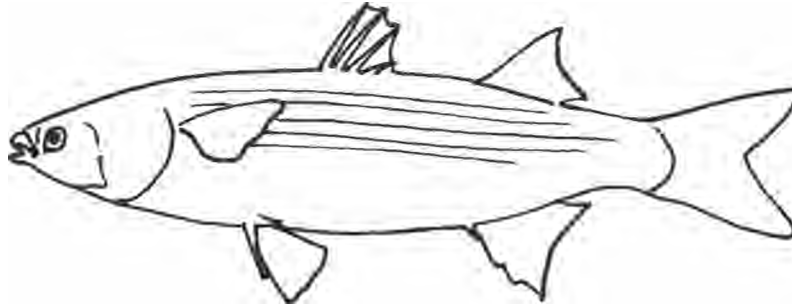
Chaetodipterus sp.
(Spadefish)

- 11(10) Mouth large extending to posterior margin of eye .. 12
- Mouth small, extending only to anterior margin of eye 13

N 0 ; 0 0 0 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 ; 0 **conspicuous..**

MUGILIDAE

(M 0 0 0 0 0)



M 0 0 0 0 0 0 0 0 0 0

(M 0 0 0 0 , L 0 0)

15(13) L 0 0 0 0 0 0 0 0 0 0 0 0 0 0 ; 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 ;
0 0 0 0 0 0 0 0 0 0 - 0 0 0 0 0 0 0 0 0 0

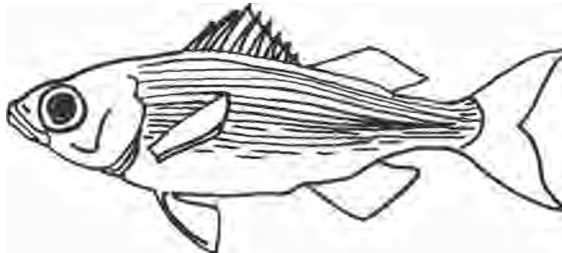
ELEOTRIDAE

(S 0 0 0 0 0 0)

L 0 0 0 0 0 0 0 0 0 0 0 0 0 0 ; 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 ;
0 0

XENICHTHYIDAE

(S 0 0 0 0)



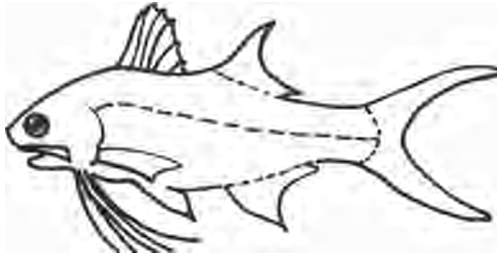
X 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

(S 0 0 0 0)

16(3) F 0 6 0 0 0 0 0 0 , 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 ; 0 0 0 0 0 0 0 0 0 0 ; 0 0 0 0 0 0 0 0 0 0 0 0 0 0 - 0 0 0 0
0 0 0 0 0 0

POLYNEMIDAE

(T 0 0 0 0 0 0 0)



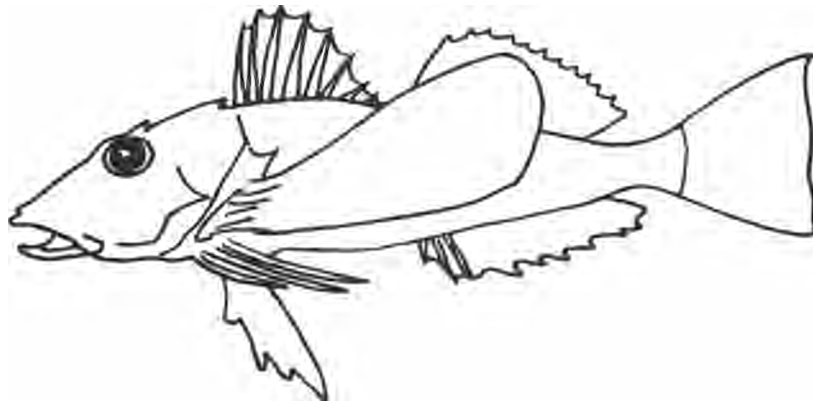
P 0 0 0 0 0 0 0 0 0 0 0 0 .

(T 0 0 0 0 0 0)

F 0 3 0 0 0 0 0 0 0 0 0 0 0
0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

TRIGLIDAE

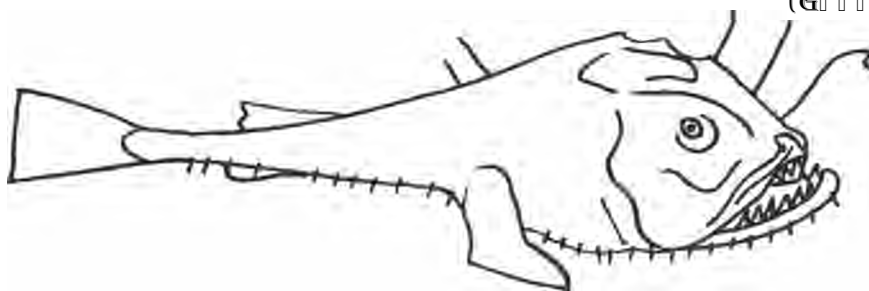
(S 0 0 0 0 0 0)



P
(S R)

17(7) M ; 3
.

LOPHIDAE
(G)



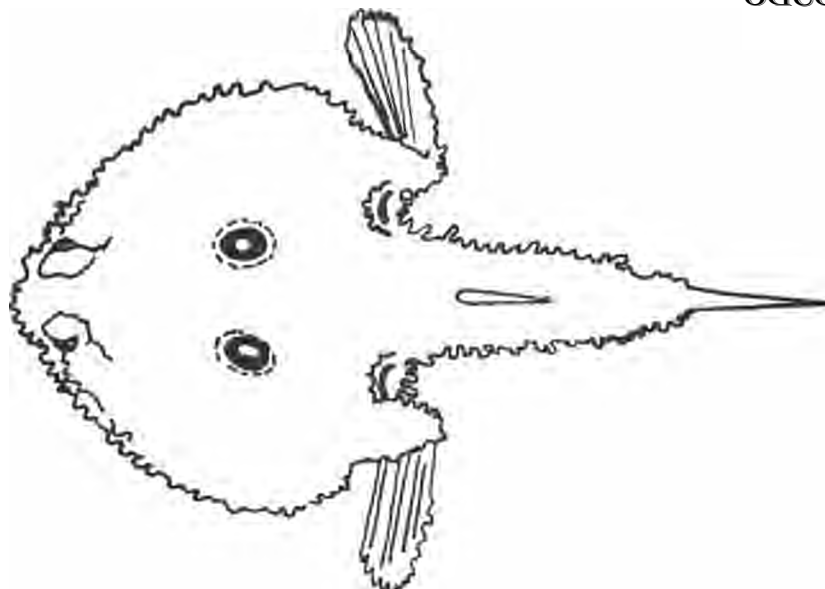
L
(G)

M ; 3
. ,
. " "
. " "

18

18(17) N ;

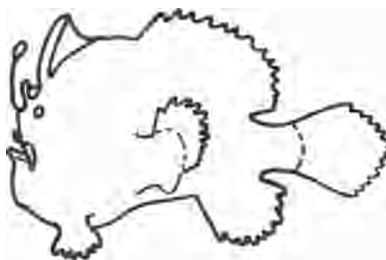
OGCOEPHALIDAE
(B)



Z
(B)

Top of body covered with small papillae; opercular region with large papillae.
 00000 000000

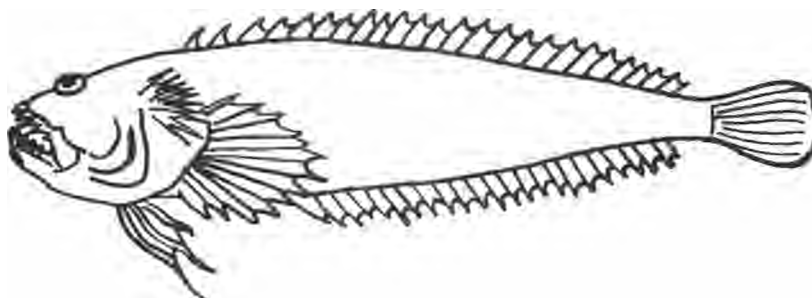
ANTENNARIIDAE
 (Antennarii)



Antennaria (Fishes of the World)

19(9) 100 00000 000 3 00000 000000 00000000 0000

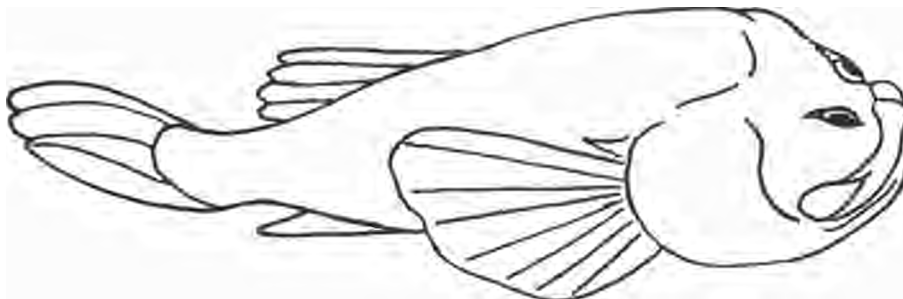
DACTYLOSCOPIDAE
 (Sloper)



Cyclopterus (Sloper)

00 00000 000 5 00000 000000 00000000 0000

URANOSCOPIDAE
 (Eggsucker)



Uranoscopus (Eggsucker)

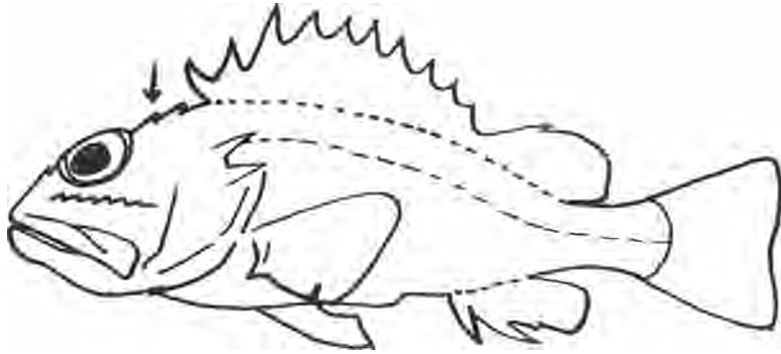
SUBKEY C

(P000000000000500000000000;0000000000000000)

1 P00000000000000,000000000000000000000000
000000 2
P00000000000000,00000000000000000000 15

2(1) N00
000;00
0000000000 3
A00
000000000000000000000000;000000000000
00000000000000000000000000000000

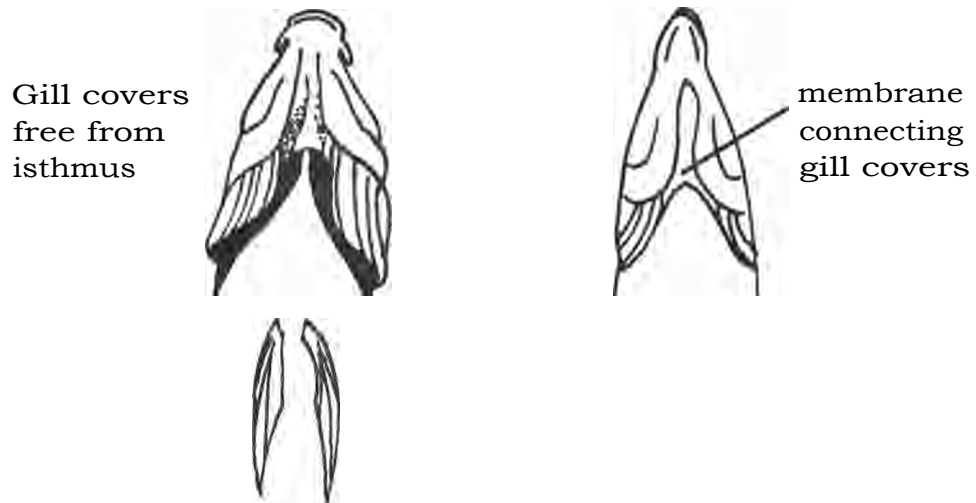
SCORPAENIDAE (S0000000000000)



Scorpaena ; uttata
(S000000)

3(2) E00000000000000000000000 4
E000000000000000000000000 20

4(3) G00
0000000000;00000000000000000000000000000015000000;
000000000000 6
G000
0000000000;000000000000000000000000000011-12;000000
000000 5

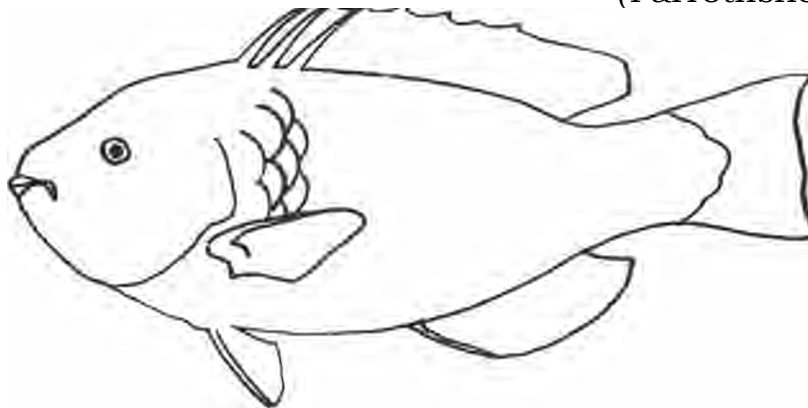


- 5(4) Jaws with a single series of separate teeth in front.....
LABRIDAE
(Wrasses)



Halichoeres sp.
(Wrasse)

- Jaw teeth either fused into a beak-like structure or with
2 to several series of overlapping incisors in front.....
SCARIDAE
(Parrotfishes)



Scarus compressus
(Parrotfish, Perico, Loro)

- 6(4) Anal fin with 3 or more spines 8
Anal fin with 2 spines 7

7(6) **A** ; ;

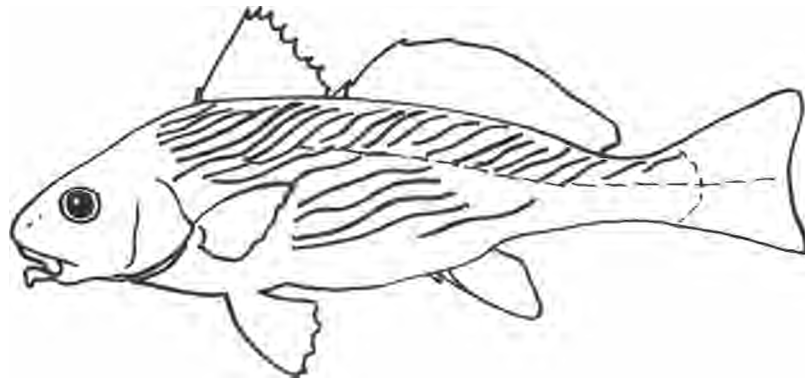
POMACENTRIDAE
()



A
(S)

A ; ;

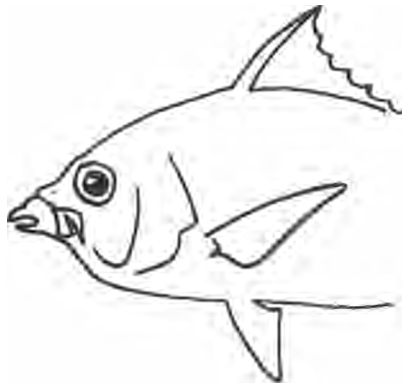
SCIANIDAE
(D)



U
(C, R ?)

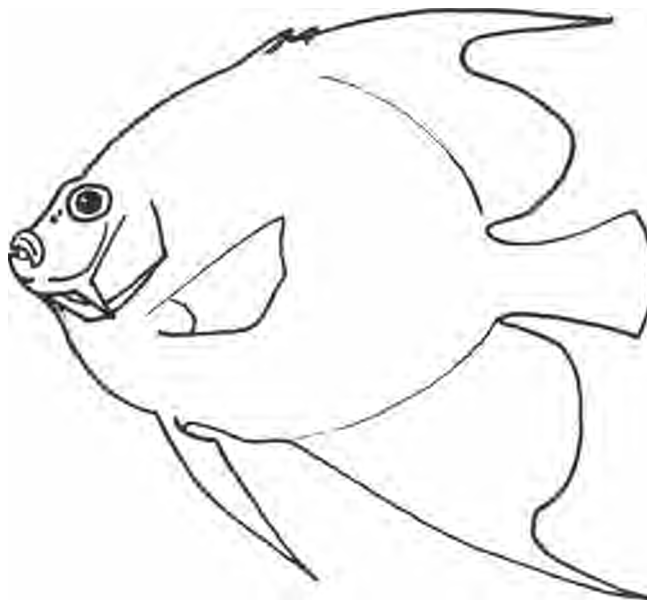
8(6) **M** ; ; 9

M ; ; **GERRIDAE**
(M)



G
(M)

- 9(8) Mouth moderate or large, reaching behind level of the anterior nostril; teeth usually firm 10
 Mouth small, not reaching the level of the anterior nostril;
 teeth more or less flexible, like the teeth of a comb;
 deep bodied and strongly compressed **CHAETODONTIDAE**
 (Butterfly and Angelfishes)

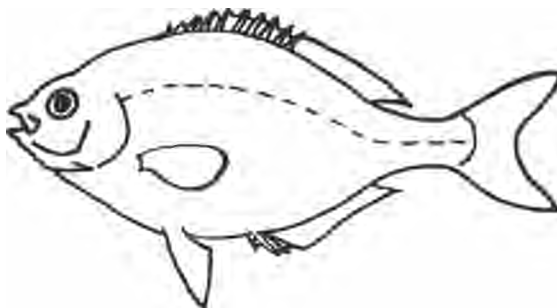


Pomacanthus zonipectus (?)
 (Black Angelfish)

- 10(9) Base of soft dorsal and anal not covered with scales 12
 Base of soft dorsal and anal covered with scales 11
- 11(10) Typically 14 dorsal spines; young have whitish blotches
 on each side of back; large bluish eye **GIRELLIDAE**
 (Opaleyes)

(see p. 2 for illustration)

- Typically 11-12 dorsal spines; young do not have whitish
 blotches on each side of back **KYPHOSIDAE**
 (Rudderfishes)



Kyphosus sp.
 (Rudderfish)

12(11) M 0 ;
 10-13 0 0 0 0 0 0 0 0 0 0 []

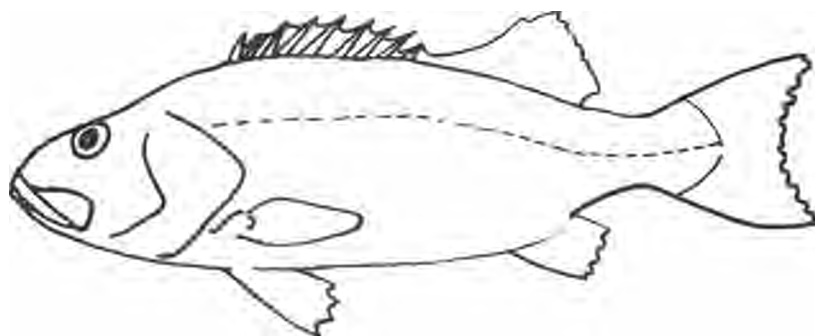
13



M 0 0 0 0 0 0

M 0 ; 6-9 0 0 0 0 0 0 0 0 0 0 []

SERRANIDAE
 (G 0 0 0 0 0 0)

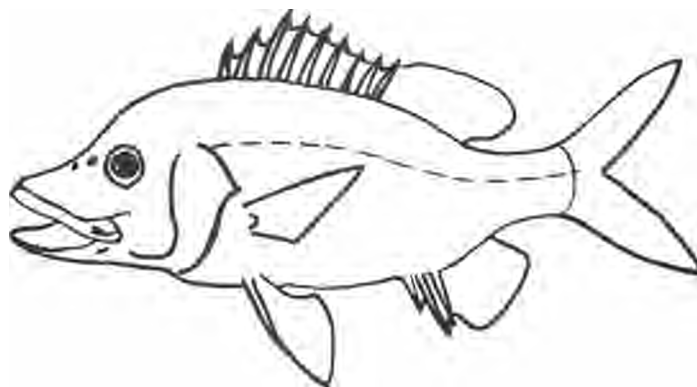


S 0 0 0 0 0 0 0 0 0 0 0 0
 (B 0 0 0 S 0 B 0 0 , M 0 0 0)

13(12) S 0 0 0 0 0 0 0 0 0 0 0 0 ; 0 0 0 0 0 0 0 0 []
 F 0 0 0 0 0 0 0 0 ; 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
 0 0 0 []

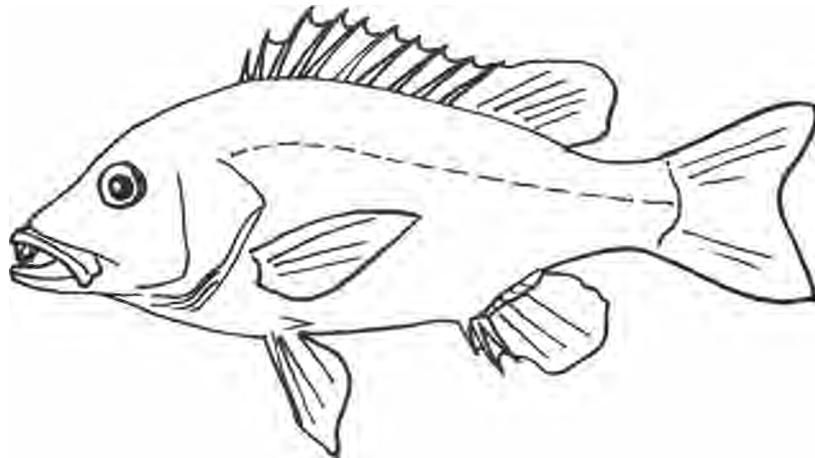
14

HAEMULIDAE
 (G 0 0 0 0)



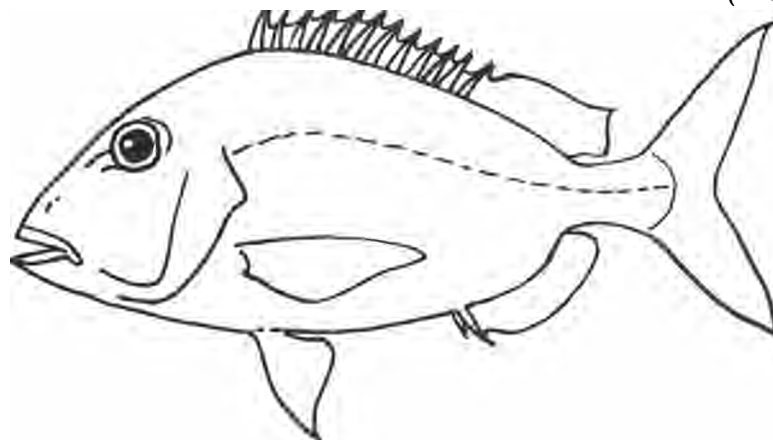
H 0 0 0 0 0 0 0 0 .
 (G 0 0 0 , R 0 0 0 0 0 0)

14(13) Teeth on palate well developed; snout characteristically flattened, has a shovel-headed appearance LUJANIDAE (Snappers)



Lutjanus sp. (Snapper, Pargo)

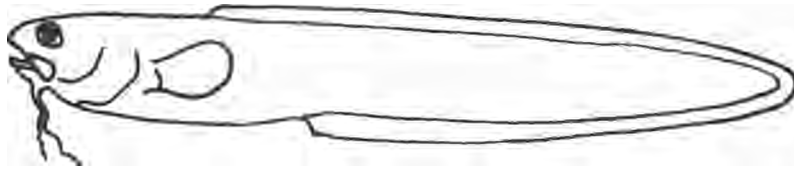
No teeth on palate; snout typically convex. SPARIDAE (Porgies)



Calamus sp. (Porgy)

- 15(1) No spines in any of the fins; tail usually pointed, dorsal and anal fins often continuous 16
- Spines in the fins, although they may be feeble; tail not pointed, dorsal and anal fins not continuous 17

16(15) P₁ reduced to a pair of fine finger-like whiskers under the chin **OPHIDIIDÆ**
 (C₁ eels)



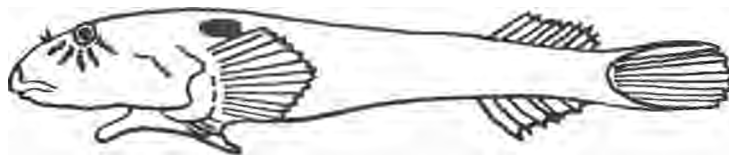
Otophidium sp.
 (C₁ eel)

P₁ reduced or absent, and when present not under the chin, but jugular **BROTULIDÆ**
 (B₁)



Brotula sp.

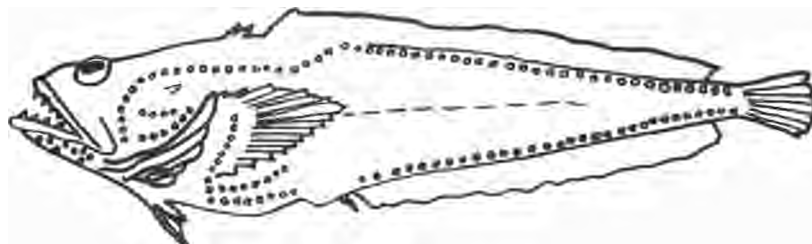
P₁ and pectorals modified into a strong sucking disc; no scales **GOBIESCOCIDÆ**
 (C₁)



Tomicodon humeralis
 (C₁, G₁)

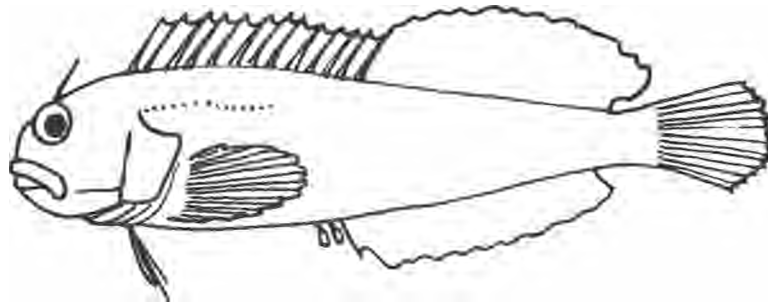
17(15) Body completely naked, no scales present 18
 Body nearly or completely scaled 19

18(17) P₁ present along dorsal and ventral surfaces; mouth large with prominent canine teeth along upper and lower jaws; no cirri on head **BATRACHODIDÆ**
 (Toadfishes)



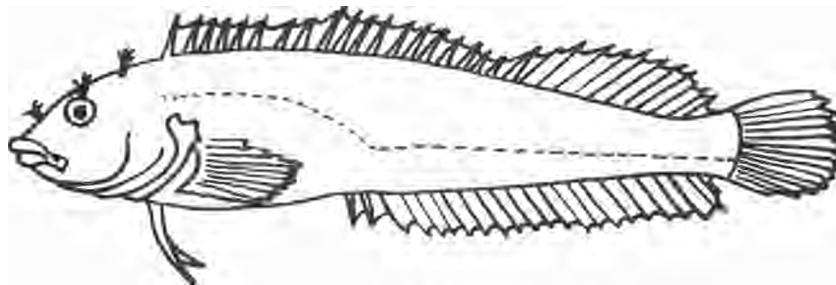
Porichthys notatus
 (Midshipman)

No photophores present; mouth small to moderately large; jaw teeth fixed, close set; one or 2 canine teeth may be present; cirri often present on head BLENNIIDAE
(Blennies)



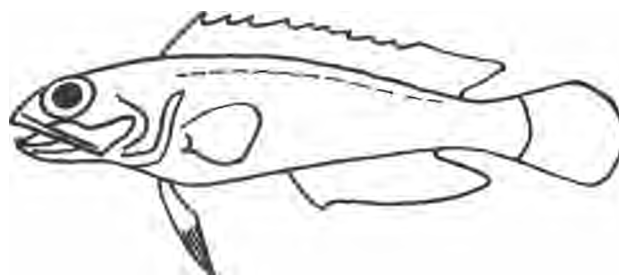
Hysoblennius gentilis
(Blenny)

19(17) Dorsal fin spines strong; cirri often present on head; lateral line complete CLINIDAE
(Clinids)



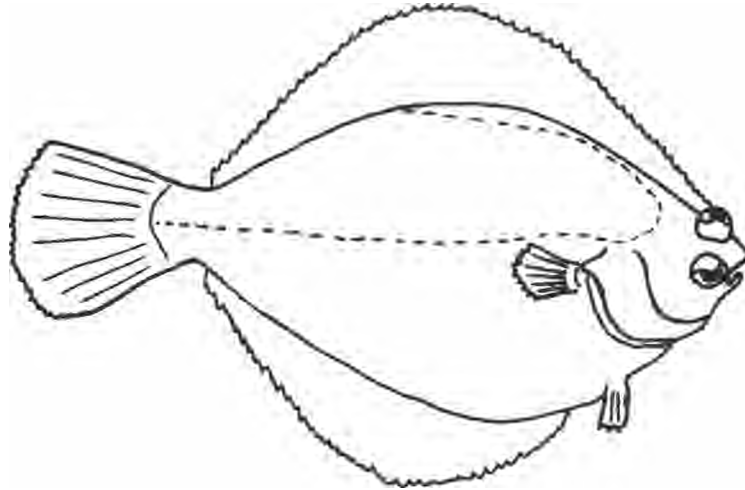
Malacoctenus sp.
(Klipfish)

Dorsal fin spines feeble; no cirri on head; lateral line incomplete; very large head and mouth OPISTHOGNATHIDAE
(Jawfishes)



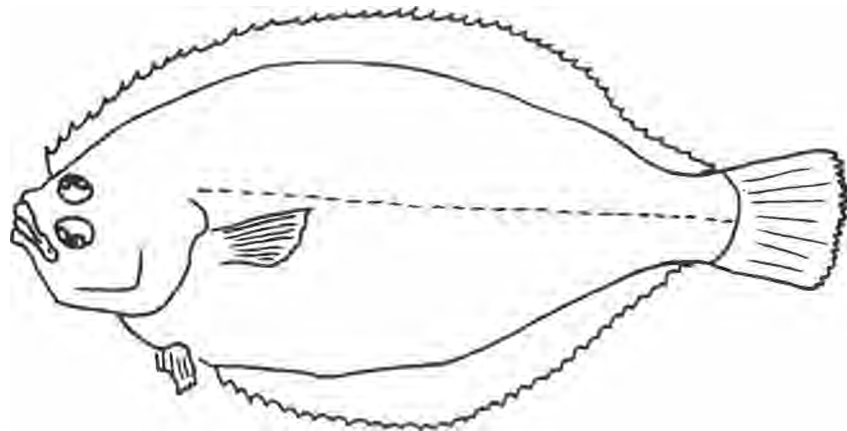
Opisthognathus sp.
(Jawfish)

20(3) Both eyes on the right side of the head PLEURONECTIDAE
(Right-eyed flounders)



Pleuronichthys sp.
(Right-eyed Flounder)

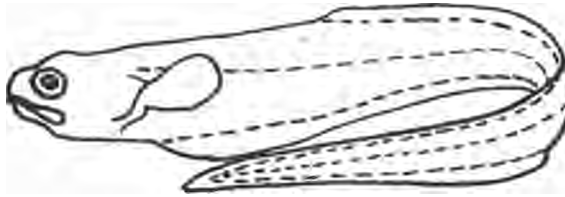
Both eyes on the left side of the head BOTHIDAE
(Left-eyed flounders)



Citharichthys sp.
(Left-eyed Flounder)

Juveniles, with a dorsal fin and a caudal fin. The body is elongated and tapers towards the tail. The head is small with a pointed snout.

CARAPIDAE
(Pomacentridae)



Carpenter's Pomacentridae
(Pomacentridae)

6(4) Pomacentridae; the body is elongated and tapers towards the tail. The head is small with a pointed snout.

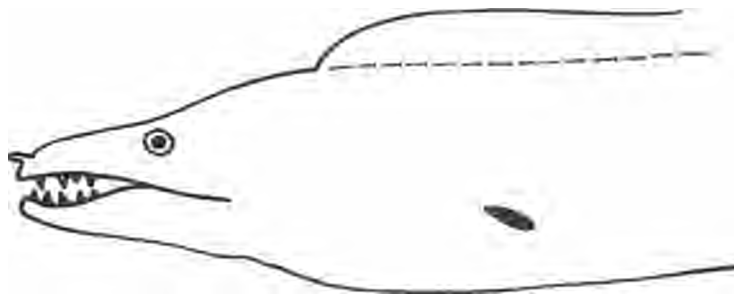
CONRIDAE
(Conruidae)



Acropora
(Conruidae, Conruidae)

Nomuraenidae; the body is elongated and tapers towards the tail. The head is small with a pointed snout.

MURAENIDAE
(Muraenidae)



Gobius
(Muraenidae, Muraenidae)

7(1) The body is elongated and tapers towards the tail. The head is small with a pointed snout.

8

9

10(9) Body covered with sharp spines; teeth in each jaw fused to one unit . . .

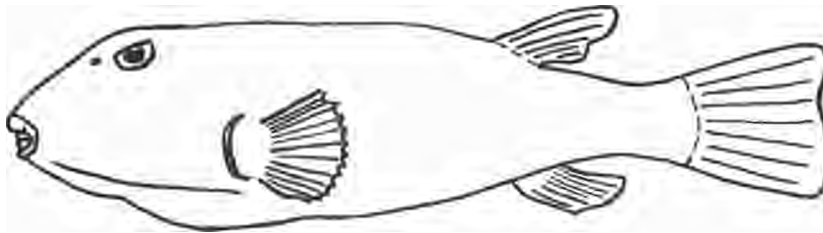
DIODONTIDAE
(Porcupine fishes)



Diodon hystrix
(Porcupine fish)

Body not covered with sharp spines, but may have prickles; fused teeth in each jaw with a distinct line of division in front

TETRAODONTIDAE
(Puffers)



Sphoeroides sp.
(Puffer, Botete)

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