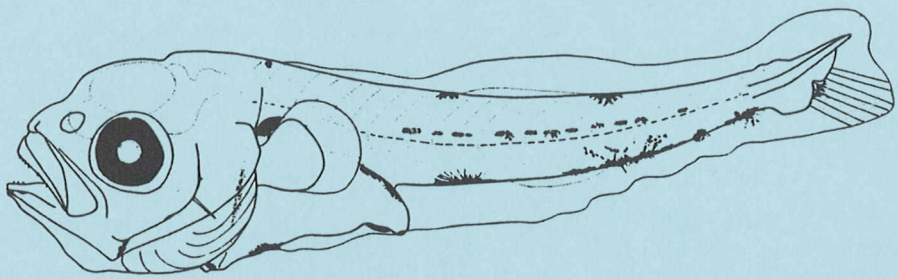
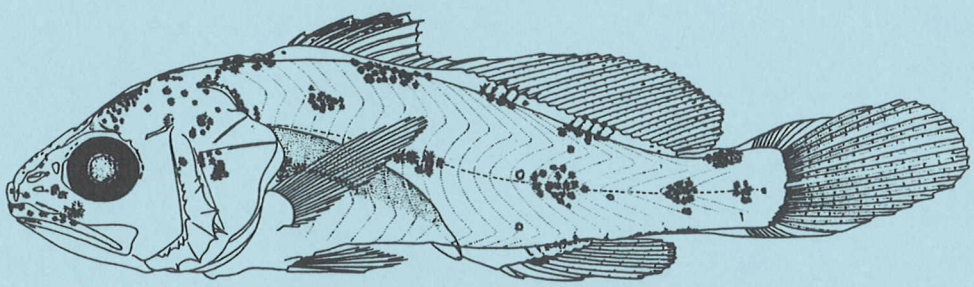
NOAA TECHNICAL MEMORANDUM
NMFS-SEFSC-349

PRELIMINARY GUIDE TO THE IDENTIFICATION OF THE EARLY LIFE HISTORY STAGES OF SCIAENID FISHES FROM THE WESTERN CENTRAL ATLANTIC

by

James G. Ditty and Richard F. Shaw





U. S. DEPARTMENT OF COMMERCE
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION
NATIONAL MARINE FISHERIES SERVICE
SOUTHEAST FISHERIES SCIENCE CENTER
MIAMI, FLORIDA 33149

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INTRODUCTION

This guide will assist in the identifying early life stages of sciaenids that occur in marine waters of the western central Atlantic, an area bounded by 35° N latitude, 50° W longitude, the equator to the south, and the continents on the west. The western-central Atlantic is primarily tropical/subtropical, is characterized by coral reef and hard bottom areas, and includes the Gulf of Mexico and Caribbean Sea.

Meristic data, and information (where available) on eggs, larvae, and juveniles are included for 21 genera and 55 species. These meristic data provide the common count with rare counts in parentheses. Illustrations are available for early-life stages of about one-third of sciaenid taxa. Taxa found primarily in freshwater habitats are excluded. I follow Chao (1978) in defining *Ophioscion adustus* (Agassiz) and *O. panamensis* (Schultz) as questionable species, and *Plagioscion squamosissimus* (Heckel) and *P. surinamensis* (Bleeker) as primarily freshwater. Because many discrepancies in meristic counts occur in the literature, I examined original descriptive work whenever possible. I defer to Chao (1978) for literature discrepancies in number of precaudal and caudal vertebrae. I include all dorsal spines with first dorsal fin counts. Range or rare counts are in parenthesis. Number of gill rakers should be used with caution. Gill rakers decrease in relative length with age, and some authors include nubs and tubercles in their counts, while others do not. For each species, the left page provides information on meristics, ecology, and larval identification characters, while the right page contains illustrations. Where information is unknown or unavailable, space is provided for additional data and notes. Users should notify me of errors, omissions, or updates so that the final guide will be complete. Many illustrations are new; both Jack Javech (NMFS, Miami) and Wayne LaRoche (Stonefish Environmental Consulting, Enosburg Falls, Vermont) provided illustrations.

Sciaenids are difficult to characterized because of the diversity of taxa. Sciaenid eggs are relatively small, with a mean diameter <1.0 mm. In general, early stage eggs possess multiple oil globules which coalesce to form a single globule as development proceeds. Late stage eggs have pigment on the oil globule (Joseph et al., 1964). Both oil globule and embryo are pigmented, and the oil globule is located in the posterior portion of the yolk-sac (Holt et al., 1988). Holt et al. (1988) discuss characters for separating eggs and yolk-sac larvae of sciaenids found along the continental United States. Although their paper is helpful for separating eggs and yolk-sac larvae of recently preserved specimens, Holt et al.'s (1988) characters are based on chromatophores which deteriorate rapidly when preserved.

Thus, chromotophore patterns would probably not be reliable a few days after preservation. Generally, sciaenids have twice as many rays in the dorsal as anal fin, length of preopercular spines are small to moderate, and most taxa have a gap between the anus and first anal spine during larval development. Sciaenids have 25 total vertebrae, except *Cynoscion nothus*, with 27 vertebrae., and *Lonchurus lanceolatus* and *Paralonchurus brasiliensis* with 29 vertebrae. Larvae and juveniles of most sciaenids along the U. S. Atlantic and Gulf coasts have been described, but few taxa from Central and South America. Larval descriptions of some taxa consist of more than one species (e.g., Hildebrand and Cable 1934) and these descriptions should be used with caution. Information on *Menticirrhus* spp. larvae should be considered punative pending a comparative description of the larvae of all three species. A summary table of adult meristics is provided in Table 1.

Table 1. Meristics and availability of early life history data for the family Sciaenidae from the western central Atlantic. ( ) = range or rare counts. E-egg, L-larvae, J-juvenile.

Species	First Dorsal	Second Dorsal	Anal	Pectoral	Gill Rakers	Vertebrae	E	L	J
Bairdiella									
batabana	XI-XII	26-28 (25-29)	II, 8 (7)	16 (15-17)	5-6+13-16=19-22	12+13			
chrysoura	XI-XII	20-22 (19-23)	II, 9 (8-10)	16 (15-17)	7-8+14-16=22-24	11+14	X	X	X
ronchus	XI-XII	23-24 (21-25)	II, 8 (7-9)	17 (16-18)	6-10+15-18=21-28	11+14			
sanctaeluciae	XI-XII	22-24	II, 9 (8-9)	15	7-8+16-18=23-26	12+13			
Ctenosciaena									
gracilicirrhus	XI	21-23 (20-24)	II, 7-8 (9)	15-16	7-9+13-17=21-25	10+15			
Cynoscion									
acoupa	XI	18-20 (17-23)	II, 8 (7-9)	17-18	2-6+8-10=10-16	12-13+13-12			
arenarius	X-XI	25-27 (24-29)	II, 11 (10-12)	18-19	3-4+9-11=12-15	12-13+13-12	X	X	X
jamaicensis	XI	23-25 (23-27)	II, 9 (8-10)	17	2-3+7-10=9-13	13+12			
leiarchus	X-XI	21-23 (20-24)	II, 11 (10-12)	18 (17-19)	2-3+5-8=7-11	25		X	X
microlepidotus	XI	23-24 (22-25)	II, 9 (8-10)	20 (18-21)	2-3+6-8=8-11	25			
nebulosus	X-XI	25-27 (24-28)	II, 10-11 (9-12)		2-3+7-9=9-12	12+13	X	X	X
nothus	XI	27-29 (26-31)	II, 8-9 (10)	18-19	3-4+8-10=11-14	15+12		X	X
regalis	XI	26-28 (24-29)	II, 11-12 (10-13)	18	4-5+10-13=14-18	13+12	X	X	X
similis	X-XI	24-29	II, 9 (8-10)		3-4+6-9=9-12	25			
steindachneri	XI	21-24	II, 10 (11-12)	16-18	3-5+8-10=11-14	25			
virescens	XI	27-31	II, 8 (7-9)	17	1-3+6-8=7-11	14+11			
Equetus									
lanceolatus	XIII-XIV	46-50 (44-55)	II, 6 (5-7)	15-16	5-6+10-13=14-18	10+15			
punctatus	XII-XIII	45-47 (44-49)	II, 7-8 (6)	17-18	5+10-13=15-18	10+15			
Isopisthus									
parvipinnis	VIII-IX	18-20 (21-22)	II, 18-20 (16-20)		2-3+7-9=9-12	11+14		X	

Larimus									
breviceps	X-XI	26-28 (24-29)	II, 6-7		9-11+19-22=28-33	11+14			
fasciatus	XI-XII	24-27	II, 6 (7)		11-13+22-25=34-36	11+14		X	X
Leiostomus									
xanthurus	XI (X-XII)	29-32 (33-35)	II, 12-13	21-22	8-12+20-24=30-36	10+15	X	X	X
Lonchurus									
lanceolatus	XI-XII	37-39	II, 8 (7-9)		4-6+11-13-15-18	11+18			
Macrodon									
ancylodon	XI	27-30	II, 8-9 (10)	16	2-3+7-9=9-12	13+12		X	X
Menticirrhus									
americanus	XI	20-21 (22-26)	I, 7 (6-8)	$\geq$20 (18-24)	2-3+0-7=2-10	10+15		X	X
littoralis	XI	22-25 (21-26)	I, 7 (6-8)	$\leq$19 (18-21)	3-5+0-8=3-12	10+15			X
saxatilis	XI	23-25 (22-27)	I, 8 (7-9)	$\geq$20 (18-21)	3-5+0-7=3-12	10+15	X	X	X
Micropogonias									
furnieri	XI	26-28 (26-30)	II, 7-8	17-19	7-9+12-15=21-25	10+15		X	X
undulatus	XI	28-29 (26-31)	II, 8 (7-9)	17-18	8-10+14-18=22-29	10+15		X	X
Nebris									
microps	VIII-IX	31-33 (28-34)	II, 9-10	16-18	5-9+14-15=20-24	12+13			
Odontoscion									
dentex	XII-XIII	22-27	II, 8-10	13-15	5-9+14-17=19-25	12+13			
Ophioscion									
punctatissimus	XI	23-24	II, 6-7	18	7-8+13-16=20-24	10+15			
Paralonchurus									
brasiliensis	XI	28-31	II, 8 (7-9)		3-5+6-9=10-14	11+18			
elegans	XI	31-33	II, 7		3-4+4-8=7-11	10+15			
Pareques									
acuminatus	X-XI	36-41	II, 7-8 (6)	16-17	5-6+9-14=14-20	10+15		?	
iwamotoi	XI (X-XII)	38 (33-40)	II, 7 (8)	17 (15-18)	4-7+9-12=15-19	10+15		X	

umbrosus	IX-XI	38-40 (37-42)	II, 7 (6-8)		4-6+10-12=15-18	10+15		?	
Pogonias									
cromis	XI	21-23 (19-23)	II, 6 (5-7)		4-6+12-16=16-21	10+14	X	X	X
Sciaena									
bathytatos	X-XI	21-23	II, 7	15-18	7-9+14-19=22-27	11+14			
trewavasae	XI	25 (24-26)	II, 7	16 (15-17)	6-7+13-15=19-21	10+15			
Sciaenops									
ocellatus	XI	24-25 (23)	II, 8 (7-9)	17	4-5+7-9=12-14	10+15	X	X	X
Stellifer									
sp. A	XII	23-24	II, 8-9		37-41	10+15			
sp. B	XIII	20-21	II, 8-9		11-12+18-21=30-33	10+15			
brasiliensis	XI	21-22	II, 9	18-19	8+14-16=22-24	10+15			
colonensis	XII	23 (22-24)	II, 8-9		10-12+19-22=29-33	10+15			
griseus	XI-XII	21-23	II, 8-9		20-23+32-36=52-59	10+15			
lanceolatus	XII-XIII	20-24	II, 8-9	19-20	10-13+22-23=32-36	10+15		X	X
microps	XI-XII	19-21	II, 9 (8-10)	18-20	7-9+13-16=20-24	10+15			
naso	XII	20-22	II, 8	18	8-9+15-16=23-25	10+15			
rastrifer	XI-XIII	21-23	II, 9 (8)	18-20	16-21+23-30=40-50	10+15		X	X
stellifer	XII	18-20	II, 8		12-14+20-25=32-38	10+15			
venezuelae	XII-XIII	21-22	II, 8 (9)	18-19	9-10+16-19=26-28	10+15			
Umbrina									
broussonneti	XI	24-25 (23-26)	II, 6	15-16	5-7+7-10=13-15	11+14			
coroides	XI	27-29 (26-31)	II, 6	17 (16-18)	5-7+7-10=13-15	11+14		X	X
milliae	XI	22-23	II, 7-8	18	7-8+11-13=19-20	11+14			

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	12
Caudal	13
Total	25
Number of fin spines and rays	
First Dorsal	XI-XII
Second Dorsal	26-28 (25-29)
Dorsal Finlets	0
Total Dorsal Elements	36-41
Anal	II, 8 (7-8)
Anal Finlets	0
Total Ventral Elements	9-10
Pectoral	16 (15-17)
Pelvic	I, 5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	5-6
Lower	13-16
Total	20-21 (19-22)
Branchiostegals	

LIFE HISTORY

Range: both coasts of Florida, Bay of Campeche (Mexico), Cuba, Puerto Rico, and the Virgin Islands
Habitat: demersal, associated with shallow seagrass beds and coral reefs
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Robins and Tabb, 1965; Chao, 1978.

Bairdiella batabana (Poey)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	11
Caudal	14
Total	25
Number of fin spines and rays	
First Dorsal	XI-XII
Second Dorsal	20-22 (19-23)
Dorsal Finlets	0
Total Dorsal Elements	31-34 (35)
Anal	II, 9 (8-10)
Anal Finlets	0
Total Ventral Elements	11 (10-12)
Pectoral	16 (15-17)
Pelvic	I, 5
Caudal	
Dorsal Secondary	8-9
Principal	9+8
Ventral Secondary	5-8
Total	30-34
Gillrakers on first arch	
Upper	7-8
Lower	14-16
Total	22-24
Branchiostegals	7

LIFE HISTORY

Range: U. S. Atlantic coast through Gulf of Mexico to northern Mexico
Habitat: demersal; coastal and estuarine waters
ELH pattern: oviparous; buoyant eggs; pelagic larvae
Spawning: Season: March-October in Gulf of Mexico, summer along U.S. Atlantic coast
Area: bays and estuaries
Mode:
Migration:

Literature: Kuntz, 1914; Welsh and Breder, 1924; Robins and Tabb, 1965; Miller and Jorgenson, 1973; Chao, 1978; Powles and Stender, 1978; Powles, 1980; Ditty et al., 1988; Holt et al., 1988; Ditty, 1989.

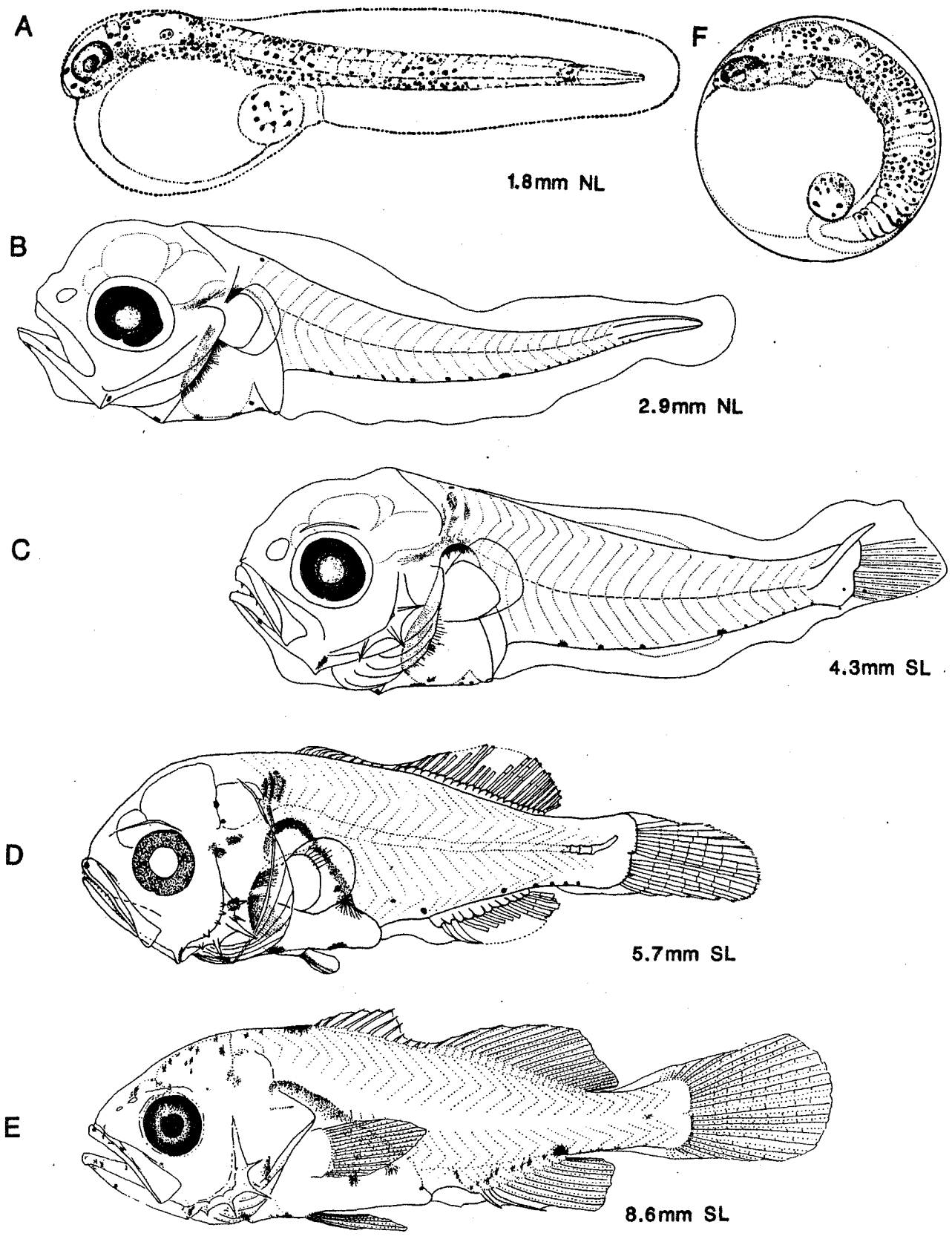
Bairdiella chrysoura (Lacepede)

EARLY LIFE HISTORY DESCRIPTION

EGGS:
Diameter: 0.59-0.82 mm
No. of Oil Globules: one
Oil Globule Diameter: 0.16-0.18 mm
Yolk:
Shell:
Hatch Size: 1.5-1.8 mm
Incubation: 18 hrs at 27°C, 40-50 hrs at 20°C
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: 3.8-4.5 mm
Length at transformation: 10.0-12.0 mm
Sequence of fin development: second dorsal-anal-first dorsal-pelvic-pectoral
Pigment: dentary, nape, cleithral symphysis, gut, ventral midline of tail, swath paralleling cleithrum
Diagnostic: distinguish from *Cynoscion* spp. by lack of pigment along isthmus of lower jaw and position of enlarged melanophore along ventral midline of tail; swath of pigment paralleling cleithrum (indistinct by mid-postflexion)

Illustrations: A and F from Kuntz, 1914; B-C from Ditty, 1989; D from Powles, 1980; E Original.


A
1.8mm NL
F
B
2.9mm NL
C
4.3mm SL
D
5.7mm SL
E
8.6mm SL

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	11
Caudal	14
Total	25
Number of fin spines and rays	
First Dorsal	XI-XII
Second Dorsal	23-24(21-25)
Dorsal Finlets	0
Total Dorsal Elements	34-35(32-37)
Anal	II,8(7-9)
Anal Finlets	0
Total Ventral Elements	10(9-11)
Pectoral	17(16-18)
Pelvic	I,5
Caudal	
Dorsal Secondary	9
Principal	9+8
Ventral Secondary	8
Total	34
Gillrakers on first arch	
Upper	6-10
Lower	15-18
Total	24-26(21-28)
Branchiostegals	

LIFE HISTORY

Range: Cuba throughout Caribbean Sea; and Vera Cruz, Mexico southward to Brazil
Habitat: demersal, estuarine and coastal waters <40 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Robins, 1964; Robins and Tabb, 1965; Miller and Jorgenson, 1973; Chao, 1978.

Bairdiella ronchus (Cuvier)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	12
Caudal	13
Total	25
Number of fin spines and rays	
First Dorsal	XI-XII
Second Dorsal	22-24
Dorsal Finlets	0
Total Dorsal Elements	33-36
Anal	II,9(8-9)
Anal Finlets	0
Total Ventral Elements	10-11
Pectoral	I,5
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	7-8
Lower	16-18
Total	23-26
Branchiostegals	

LIFE HISTORY

Range: Antilles, and Costa Rica to Guyana, occasionally Atlantic coast of Florida
Habitat: demersal, estuarine and nearshore coastal waters
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Cervigon, 1966; Chao, 1978.

Bairdeilla sanctaeluciae (Jordan)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	21-23(20-24)
Dorsal Finlets	0
Total Dorsal Elements	32-34(31-35)
Anal	II,7-8(9)
Anal Finlets	0
Total Ventral Elements	9-10(11)
Pectoral	15-16
Pelvic	I,5
Caudal	
Dorsal Secondary	7-8
Principal	9+8
Ventral Secondary	6-8
Total	30-33
Gillrakers on first arch	
Upper	7-9
Lower	13-17
Total	21-25
Branchiostegals	6

LIFE HISTORY

Range: Nicaragua south to Brazil
Habitat: demersal, coastal waters <80 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Miller, 1971; Miller and Jorgenson, 1973; Chao, 1978.

Ctenosciaena gracilicirrhus (Metzelaar)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	12(13)
Caudal	13(12)
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	18-20(17-23)
Dorsal Finlets	0
Total Dorsal Elements	29-31(28-34)
Anal	II, 8(7-9)
Anal Finlets	0
Total Ventral Elements	10(9-11)
Pectoral	17-18
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	2-6
Lower	8-10
Total	12-15(10-16)
Branchiostegals	

LIFE HISTORY

Range: Nicaragua south
Habitat: demersal, estuarine and coastal waters <22 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Magoleccia, 1965; Chao, 1978; Cervigon et al., 1993.

Cynoscion acoupa (Lacepede)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Cynoscion acoupa SCIAENIDAE

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	12(13)
Caudal	13(12)
Total	25
Number of fin spines and rays	
First Dorsal	X-XI
Second Dorsal	25-27(24-29)
Dorsal Finlets	0
Total Dorsal Elements	36-38(34-40)
Anal	II, 11(10-12)
Anal Finlets	0
Total Ventral Elements	13(12-14)
Pectoral	18-19
Pelvic	I,5
Caudal	
Dorsal Secondary	6-8
Principal	9+8
Ventral Secondary	5-8
Total	28-33
Gillrakers on first arch	
Upper	3-4
Lower	10(9-11)
Total	13-15(12-15)
Branchiostegals	7

LIFE HISTORY

Range: Gulf of Mexico to Yucatan peninsula of Mexico
Habitat: demersal, estuarine and coastal waters
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning: Season: usually March to September
Area: coastal waters
Mode:
Migration: inshore-offshore

Literature: Ginsburg, 1929; Miller and Jorgenson, 1973; Mohammad - Moshin, 1973; Daniels, 1977; Chao, 1978; Ditty et al., 1988; Holt et al., 1988; Ditty, 1989.

Cynoscion arenarius Ginsburg

EARLY LIFE HISTORY DESCRIPTION

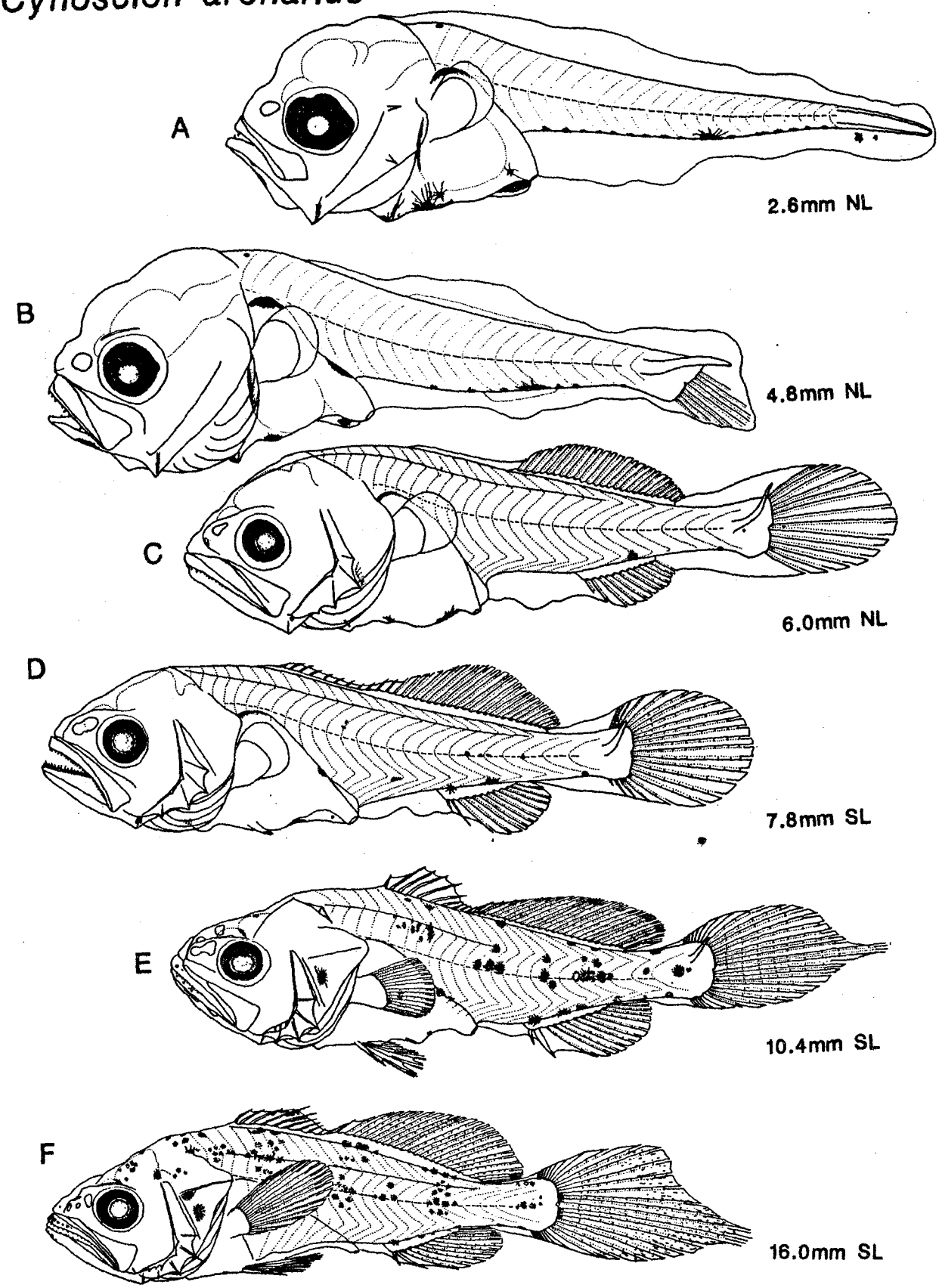
EGGS:
Diameter: 0.7-0.9 mm
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: 4.2-5.2 mm
Length at transformation: 10.0-12.0 mm
Sequence of fin development: caudal - dorsal and anal-pelvic-pectoral
Pigment: nape, gular isthmus between lower jaw rami, along gut, along ventral midline of tail (largest melanophore on myomere 16-17), melanophore along dorsal midline above termination of anal fin base in some from Gulf of Mexico (see *C. regalis*)
Diagnostic: separate from most other genera by pigment along gular isthmus; position of enlarged melanophore along ventral midline of tail

Illustrations: A-B from Ditty, 1989; C - F Original.

Cynoscion arenarius

SCIAENIDAE



SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	13
Caudal	12
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	23-25(23-27)
Dorsal Finlets	0
Total Dorsal Elements	34-36(34-38)
Anal	II, 9(8-10)
Anal Finlets	0
Total Ventral Elements	11(10-12)
Pectoral	17
Pelvic	I,5
Caudal	
Dorsal Secondary	7-8
Principal	9+8
Ventral Secondary	6-7
Total	30-32
Gillrakers on first arch	
Upper	2-3
Lower	7-10
Total	9-13
Branchiostegals	

LIFE HISTORY

Range: Lesser Antilles and Puerto Rico, also Panama south
Habitat: demersal, estuarine and coastal waters <60 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Meek and Hildebrand, 1925; Gilbert and Kelso, 1971; Miller and Jorgenson, 1973; Chao, 1978.

Cynoscion jamaicensis (Vaillant and Bocourt)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Cynoscion jamaicensis SCIAENIDAE

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	
Caudal	
Total	25
Number of fin spines and rays	
First Dorsal	X-XI
Second Dorsal	21-23(20-24)
Dorsal Finlets	0
Total Dorsal Elements	32-35(31-35)
Anal	II,11(10-12)
Anal Finlets	0
Total Ventral Elements	13(12-14)
Pectoral	18(17-19)
Pelvic	I,5
Caudal	
Dorsal Secondary	7-8
Principal	9+8
Ventral Secondary	7
Total	31-32
Gillrakers on first arch	
Upper	2-3
Lower	5-8
Total	7-11
Branchiostegals	

LIFE HISTORY

Range: Panama to Brazil
Habitat: demersal, estuarine and coastal waters <40 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Meek and Hildebrand, 1925; Megoleccia, 1965; Cervigon, 1966; Miller and Jorgenson, 1973; Chao, 1978; Cervigon et al., 1993.

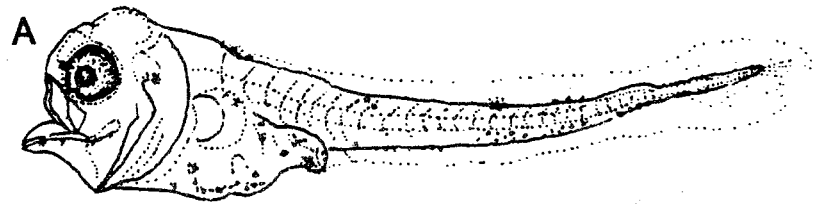
Cynoscion leiarchus (Cuvier)

EARLY LIFE HISTORY DESCRIPTION

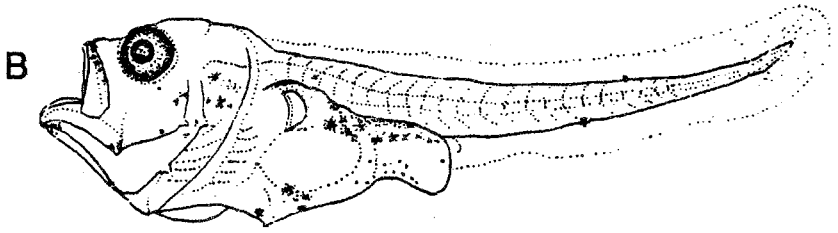
EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: by 5.2 mm
Length at transformation: unknown
Sequence of fin development: caudal-dorsal and anal-pelvics-pectorals
Pigment: patch of pigment on upper opercle, and pigment laterally over visceral mass and hindgut
Diagnostic:

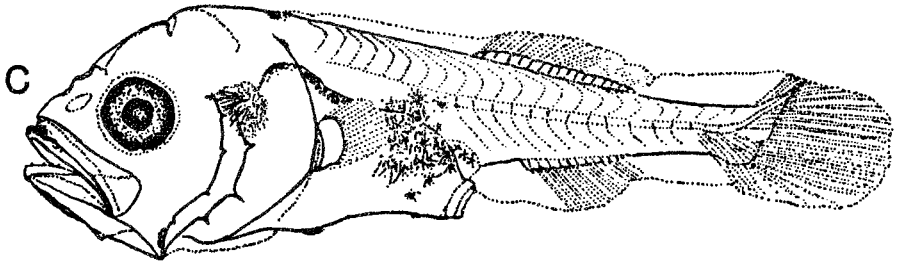
Illustrations: A-E from Sinque, 1980.



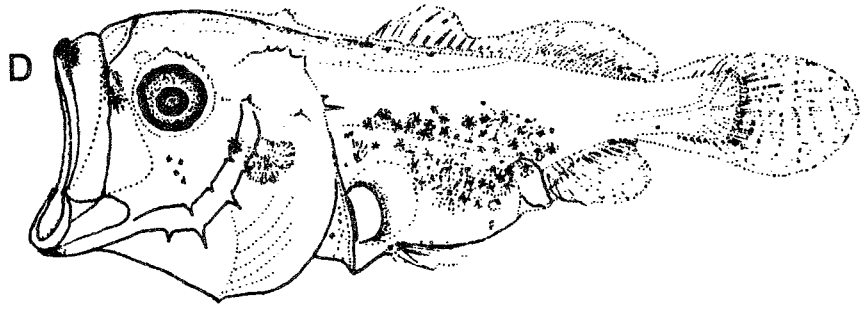
2.9mm NL



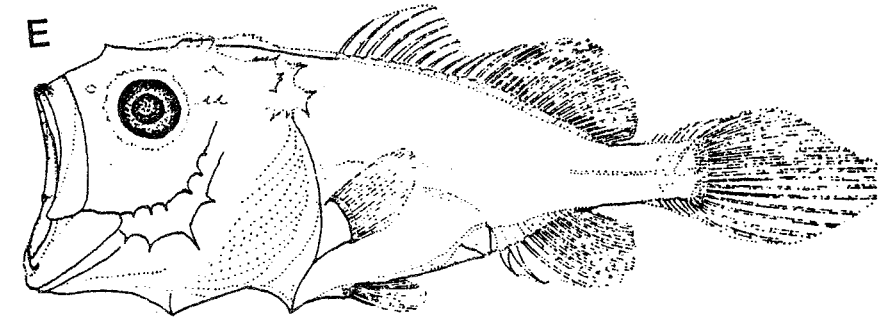
3.8mm NL



5,2mm SL



8.2mm SL



14.6mm SL

SCIAENIDAE

Cynoscion microlepidotus (Cuvier)

MERISTICS

Vertebrae	
Precaudal	
Caudal	
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	23-24(22-25)
Dorsal Finlets	0
Total Dorsal Elements	34-35(33-36)
Anal	II,9(8-10)
Anal Finlets	0
Total Ventral Elements	11(10-12)
Pectoral	20(18-21)
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	2-3
Lower	6-8
Total	8-11
Branchiostegals	

LIFE HISTORY

Range: Columbia to Brazil
Habitat: demersal, estuarine and coastal waters <30 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Chao, 1978; Cervigon et al., 1993.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

MERISTICS

Vertebrae	
Precaudal	12
Caudal	13
Total	25
Number of fin spines and rays	
First Dorsal	X-XI
Second Dorsal	25-27(24-28)
Dorsal Finlets	0
Total Dorsal Elements	35-38(34-39)
Anal	II,10-11(9-12)
Anal Finlets	0
Total Ventral Elements	12-13(11-14)
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	6-9
Principal	9+8
Ventral Secondary	5-7
Total	29-33
Gillrakers on first arch	
Upper	3(2)
Lower	8(7-9)
Total	11(9-12)
Branchiostegals	7

LIFE HISTORY

Range: U. S. Atlantic coast through Gulf of Mexico to northern Mexico
Habitat: demersal, estuarine and shallow coastal waters
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning: Season: March-September
Area: estuarine and nearshore coastal waters
Mode:
Migration:

Literature: Ginsburg, 1929; Mohammad-Moshin, 1973; Miller and Jorgenson, 1973; Daniels, 1977; Chao, 1978; Fable et al., 1978; Powles and Stender, 1978; Stender, 1980; Ditty et al., 1988; Ditty, 1989.

EARLY LIFE HISTORY DESCRIPTION

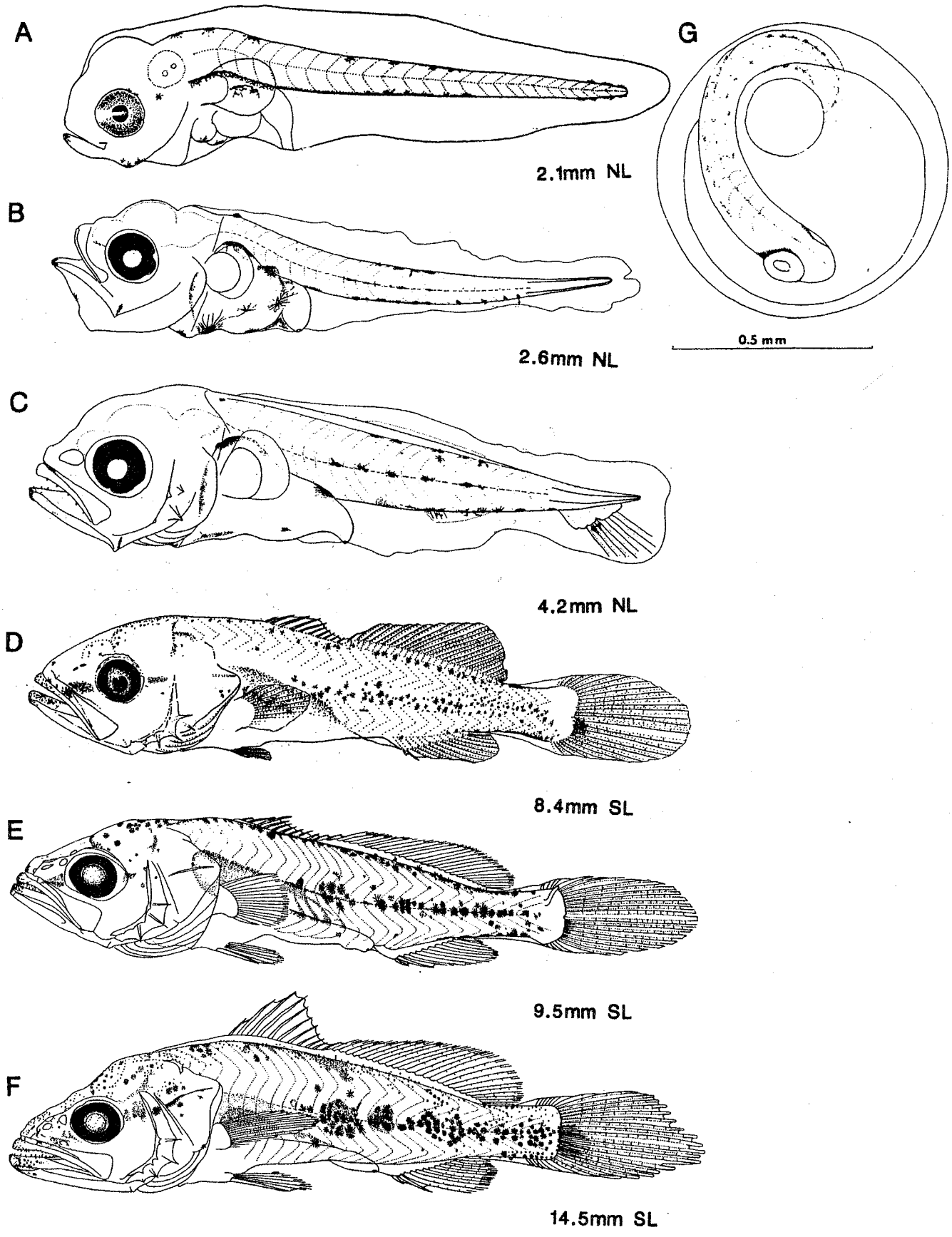
EGGS:
Diameter: 0.70-0.85 (mean: 0.77)
No. of Oil Globules: varies with egg stage
Oil Globule Diameter: 0.18-0.27 mm (mean: 0.22), when single oil globule present
Yolk: Homogeneous
Shell: clear and unsculptured
Hatch Size: 1.3-1.6 mm (mean: 1.5 mm)
Incubation: 21 hrs at 23°C, 16-20 hrs at 25°C, 15 hrs at 27°C.
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: 3.7-4.8 mm
Length at transformation: 10.0-12.0 mm
Sequence of fin development: caudal -dorsal and anal-pelvics-pectorals
Pigment: palatines, head, nape, gut, dorsal, lateral, and ventral midlines
Diagnostic: pigment on palatines separates from all but *Menticirrhus*; pigment concentrated along body midlines; mediolateral stripe of pigment thru snout

Illustrations: A and G from Fable et. al, 1978; B-C from Ditty, 1989; D-F Original.

Cynoscion nebulosus

SCIAENIDAE



SCIAENIDAE

Cynoscion nothus (Holbrook)

MERISTICS

Vertebrae	
Precaudal	15
Caudal	12
Total	27
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	27-29(26-31)
Dorsal Finlets	0
Total Dorsal Elements	38-40(37-42)
Anal	II,8-9(10)
Anal Finlets	0
Total Ventral Elements	10-11(12)
Pectoral	18-19
Pelvic	I,5
Caudal	
Dorsal Secondary	7-8
Principal	9+8
Ventral Secondary	6-8
Total	30-33
Gillrakers on first arch	
Upper	3(4)
Lower	10(8-9)
Total	12-14(11)
Branchiostegals	7

LIFE HISTORY

Range: U. S. Atlantic coast through Gulf of Mexico to Yucatan peninsula of Mexico
Habitat: demersal, coastal waters
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning: Season: May-November, usually August-October
Area: coastal waters
Mode:
Migration:

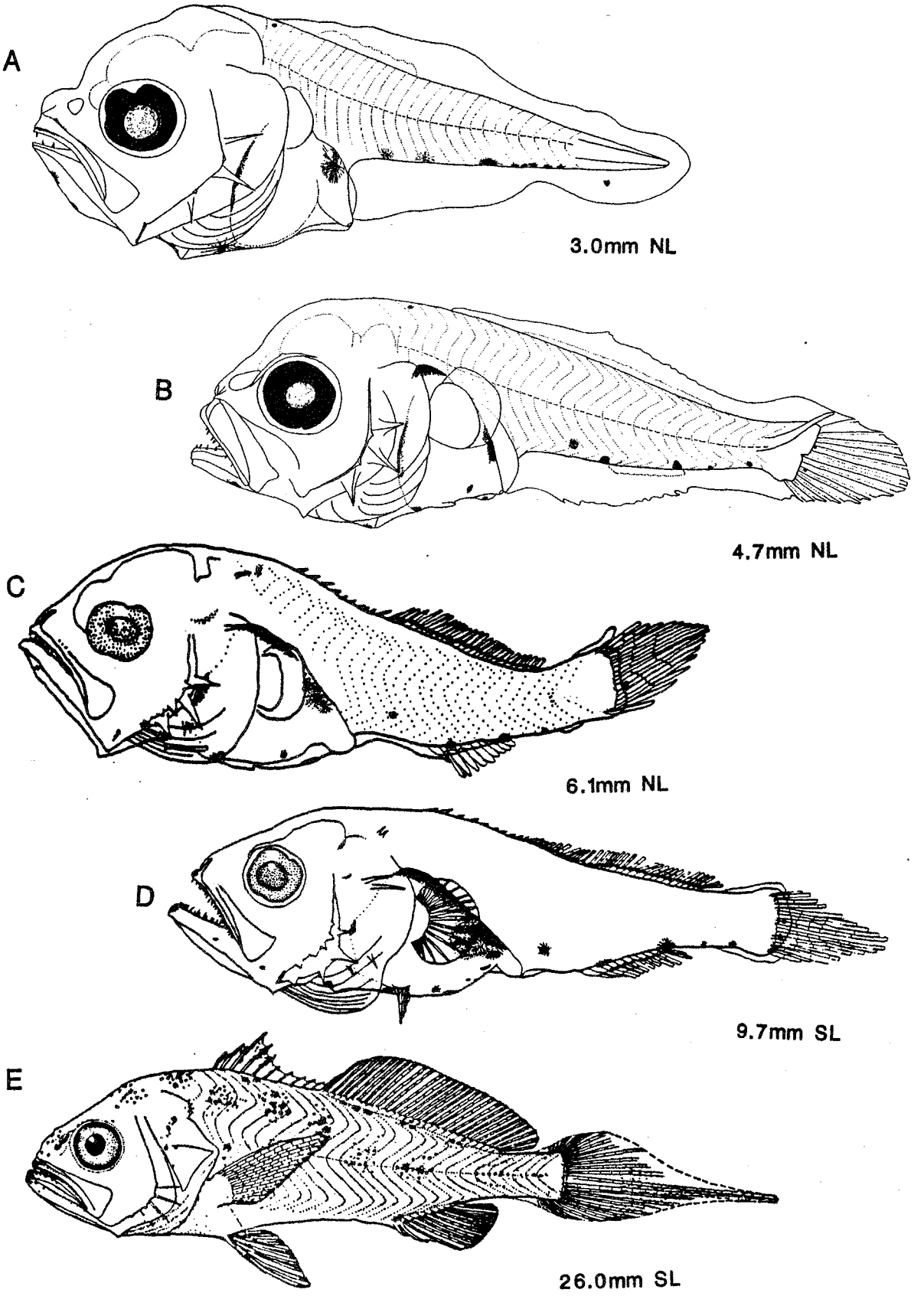
Literature: Ginsburg, 1929; Miller and Jorgenson, 1973; Powles and Stender, 1978; Stender, 1980; Ditty et al.,1988; Ditty, 1989.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: 3.5-5.0 mm
Length at transformation: 10.0-12.0 mm
Sequence of fin development:
Pigment: melanophore along gular isthmus between lower jaw rami, on nape, along gut and along ventral midline of tail [largest melanophores in anus-anal fin gap (myomere 12), and at origin (myomere 14-15), and termination (myomere 19-20) of anal fin base]
Diagnostic: myomere count, gular pigment, large eye, sparse dorsal and lateral pigment, position of enlarged melanophores along ventral midline of tail

Illustrations: A-B from Ditty, 1989; C-D from Stender, 1980; E from Hildebrand and Cable, 1934.


A
3.0mm NL
B
4.7mm NL
C
6.1mm NL
D
9.7mm SL
E
26.0mm SL

SCIAENIDAE

Cynoscion regalis (Bloch and Schneider)

MERISTICS

Vertebrae	
Precaudal	13
Caudal	12
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	26-28(24-29)
Dorsal Finlets	0
Total Dorsal Elements	37-39(35-40)
Anal	II,11-12(10-13)
Anal Finlets	0
Total Ventral Elements	13-14(12-15)
Pectoral	18
Pelvic	I, 5
Caudal	
Dorsal Secondary	7-9
Principal	9+8
Ventral Secondary	5-7
Total	29-33
Gillrakers on first arch	
Upper	5(4)
Lower	11-12(10-13)
Total	16-18(14-18)
Branchiostegals	7

LIFE HISTORY

Range: Atlantic coast of United States
Habitat: demersal, estuarine and coastal waters
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning: Season: primarily summer along U. S. Atlantic coast
Area: coastal waters over continental shelf
Mode:
Migration: inshore-offshore

Literature: Welsh and Breder, 1924; Pearson, 1941; Miller and Jorgenson, 1973; Powles and Stender, 1978;Stender, 1980; Ditty, 1989.

EARLY LIFE HISTORY DESCRIPTION

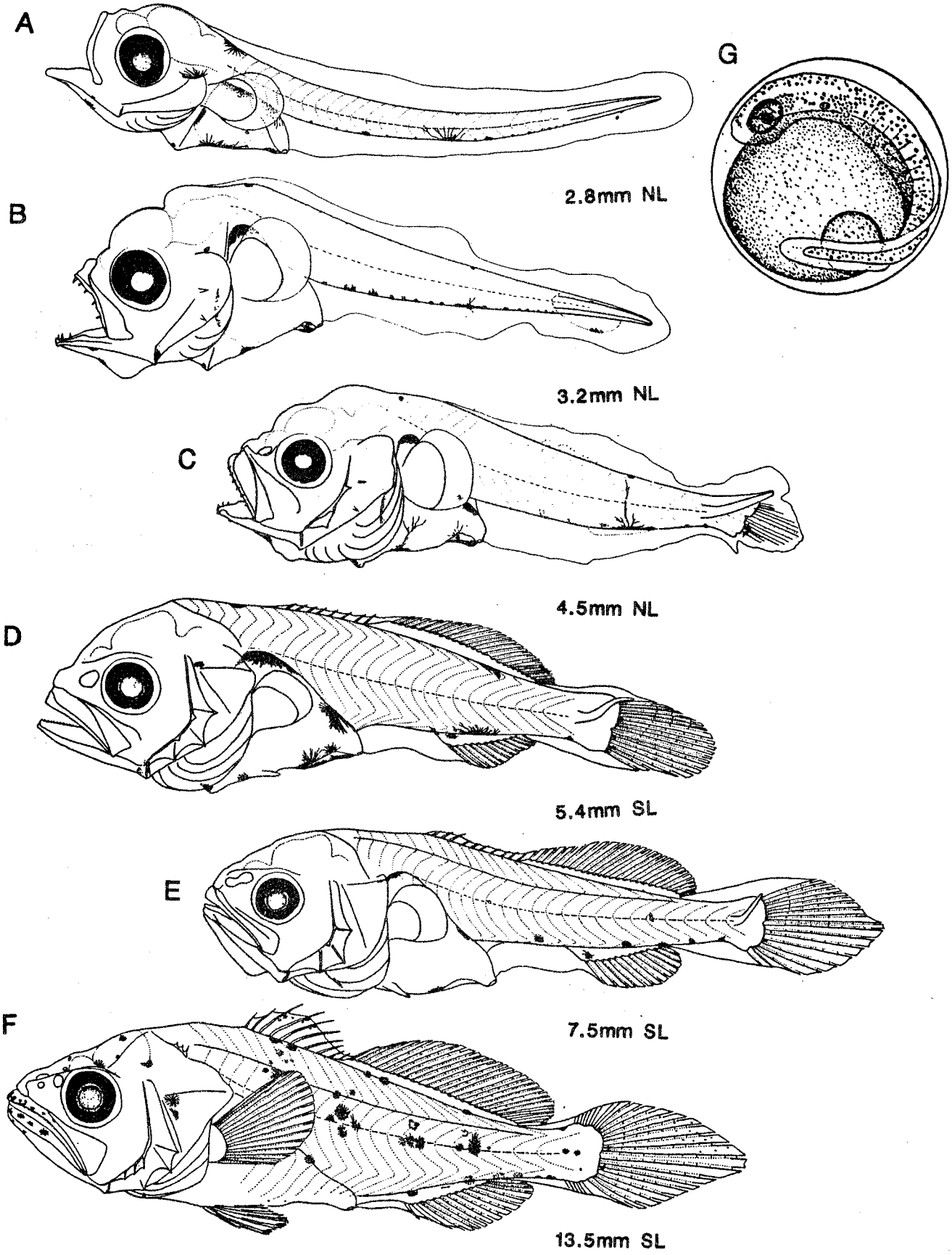
EGGS:
Diameter: 0.74-1.10 mm
No. of Oil Globules: varies with egg stage
Oil Globule Diameter: varies depending on number
Yolk:
Shell:
Hatch Size: 1.7 mm
Incubation: 36-40 hrs at 20-21°C
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: 4.0-4.5 mm
Length at transformation: 10.0-12.0 mm
Sequence of fin development: caudal-dorsal and anal-pelvic-pectoral
Pigment: melanophore along gular isthmus between lower jaw rami, on nape, along gut and ventral midline of tail (largest melanophore on myomere 16-17), melanophore along dorsal midline near anal fin termination in some
Diagnostic: separate from other known sciaenids by pigment along gular isthmus, and position of enlarged melanophore along ventral midline of tail

Illustrations: A from Ditty, 1989; B-F Original; G from Welsh and Breder, 1924.

Cynoscion regalis

SCIAENIDAE



SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	
Caudal	
Total	25
Number of fin spines and rays	
First Dorsal	X-XI
Second Dorsal	24-29
Dorsal Finlets	0
Total Dorsal Elements	34-40
Anal	II,9(8-10)
Anal Finlets	0
Total Ventral Elements	11(10-12)
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	3-4
Lower	6-9
Total	9-12
Branchiostegals	

LIFE HISTORY

Range: Gulf of Venezuela to northern Brazil
Habitat: demersal, estuarine and shelf waters <60 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Chao, 1978.

Cynoscion similis Randall and Cervigon

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	
Caudal	
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	21-24
Dorsal Finlets	0
Total Dorsal Elements	32-35
Anal	II,10(11-12)
Anal Finlets	0
Total Ventral Elements	12(13-14)
Pectoral	16-18
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	3-5
Lower	8-10
Total	11-14
Branchiostegals	

LIFE HISTORY

Range: Guyana to northern Brazil
Habitat: demersal, brackish swamps and estuaries
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Chao, 1978.

Cynoscion steindachneri (Jordan)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Cynoscion steindachneri SCIAENIDAE

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	14
Caudal	11
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	27-31
Dorsal Finlets	0
Total Dorsal Elements	38-42
Anal	II,8(7-9)
Anal Finlets	0
Total Ventral Elements	10(9-11)
Pectoral	17
Pelvic	I,5
Caudal	
Dorsal Secondary	6-7
Principal	9+8
Ventral Secondary	5-7
Total	28-31
Gillrakers on first arch	
Upper	1-3
Lower	6-8
Total	9-10(7-11)
Branchiostegals	

LIFE HISTORY

Range: Honduras south
Habitat: demersal, estuarine and coastal waters <70 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Hildebrand and Meek, 1925; Cervigon, 1966; Miller and Jorgenson, 1973; Chao, 1978.

Cynoscion virescens (Cuvier)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XIII-XIV
Second Dorsal	46-50(44-55)
Dorsal Finlets	0
Total Dorsal Elements	59-64(58-68)
Anal	II,6(5-7)
Anal Finlets	0
Total Ventral Elements	8(7-9)
Pectoral	15-16
Pelvic	I, 5
Caudal	
Dorsal Secondary	6-7
Principal	9+8
Ventral Secondary	4-5
Total	27-29
Gillrakers on first arch	
Upper	5-6
Lower	10-13
Total	14-18
Branchiostegals	

LIFE HISTORY

Range: U. S. Atlantic coast, Gulf of Mexico, Antilles, and Mexico to Brazil
Habitat: coral reef and hard bottom areas
ELH pattern: oviparous
Spawning: Season: summer along U.S. Atlantic and Gulf coasts
Area:
Mode:
Migration:

Literature: Cervigon, 1966; Randall, 1968; Miller and Jorgenson, 1973; Chao, 1978; Powles and Stender, 1978; Darovec, 1983.

Equetus lanceolatus (Linnaeus)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XII-XIII
Second Dorsal	45-47(44-49)
Dorsal Finlets	0
Total Dorsal Elements	57-60(56-62)
Anal	II, 7-8(6)
Anal Finlets	0
Total Ventral Elements	9-10(8)
Pectoral	17-18
Pelvic	I, 5
Caudal	
Dorsal Secondary	7
Principal	9+8
Ventral Secondary	5-7
Total	29-31
Gillrakers on first arch	
Upper	5
Lower	10-13
Total	15-18
Branchiostegals	

LIFE HISTORY

Range: U. S. Atlantic coast, Antilles, and Panama to Brazil
Habitat: coral reef and hard bottom areas
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Cervigon, 1966; Randall, 1968; Miller and Jorgenson, 1973; Chao, 1978; Powles and Stender, 1978.

Equetes punctatus (Bloch and Schneider)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Equetus punctatus SCIAENIDAE

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	11
Caudal	14
Total	25
Number of fin spines and rays	
First Dorsal	VIII-IX
Second Dorsal	18-20(21-22)
Dorsal Finlets	0
Total Dorsal Elements	26-29(26-31)
(Two widely separate dorsal fins)	
Anal	II,18-20(16)
Anal Finlets	0
Total Ventral Elements	20-22(18)
Pectoral	
Pelvic	I, 5
Caudal	
Dorsal Secondary	7-9
Principal	9+8
Ventral Secondary	6-9
Total	30-35
Gillrakers on first arch	
Upper	2-3
Lower	7-9
Total	9-12
Branchiostegals	

LIFE HISTORY

Range: Panama south
Habitat: demersal, estuarine and coastal waters <45 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Miller and Jorgenson, 1973; Chao, 1978; Sinque, 1980.

Isopisthus parvipinnis (Cuvier)

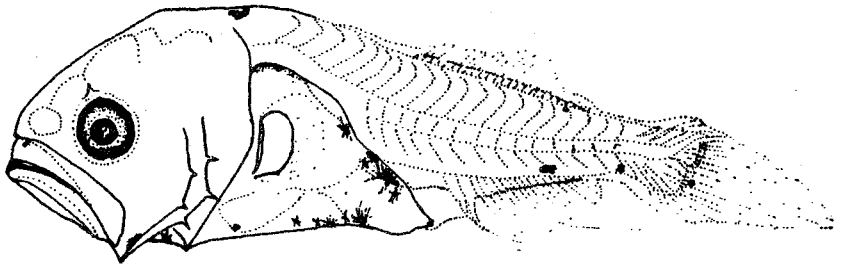
EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: unknown
Length at transformation: unknown
Sequence of fin development: unknown
Pigment:
Diagnostic:

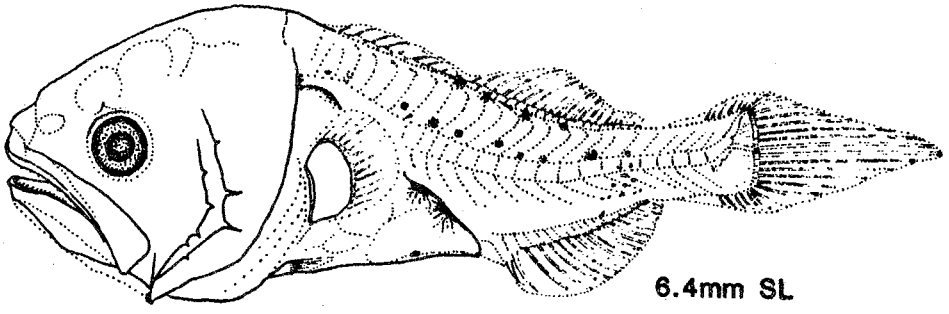
Illustrations: C-E from Sinque, 1980.

C



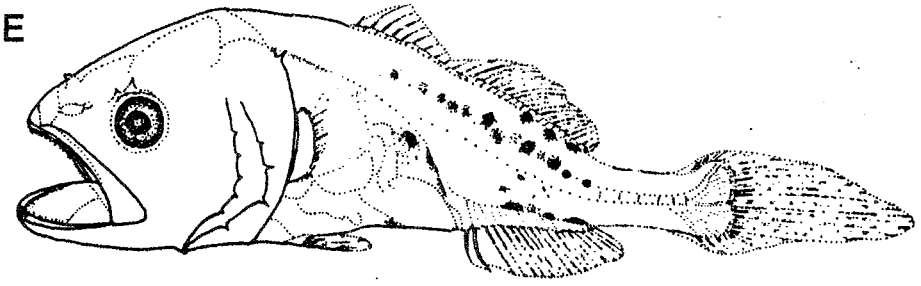
5.3mm SL

D



6.4mm SL

E



9.2mm SL

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	11
Caudal	14
Total	25
Number of fin spines and rays	
First Dorsal	X-XI
Second Dorsal	26-28(24-29)
Dorsal Finlets	0
Total Dorsal Elements	36-39(34-40)
Anal	II,6-7
Anal Finlets	0
Total Ventral Elements	8-9
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	6-7
Principal	9+8
Ventral Secondary	6
Total	29-30
Gillrakers on first arch	
Upper	9-11
Lower	19-22
Total	28-33
Branchiostegals	

LIFE HISTORY

Range: Cuba, Greater Antilles, and Costa Rica through Brazil
Habitat: demersal, estuarine and coastal waters <60 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Miller and Jorgenson, 1973; Chao, 1978.

Larimus breviceps Cuvier

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

MERISTICS

Vertebrae	
Precaudal	11
Caudal	14
Total	25
Number of fin spines and rays	
First Dorsal	XI-XII
Second Dorsal	24-27
Dorsal Finlets	0
Total Dorsal Elements	35-39
Anal	II,6(7)
Anal Finlets	0
Total Ventral Elements	8(9)
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	6-7
Principal	9+8
Ventral Secondary	4-7
Total	28-31
Gillrakers on first arch	
Upper	11-13
Lower	22-25
Total	34-36
Branchiostegals	7

LIFE HISTORY

Range: U. S. Atlantic coast and Gulf of Mexico
Habitat: demersal, coastal waters <60 m
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning: Season: April-November
Area: continental shelf waters
Mode:
Migration:

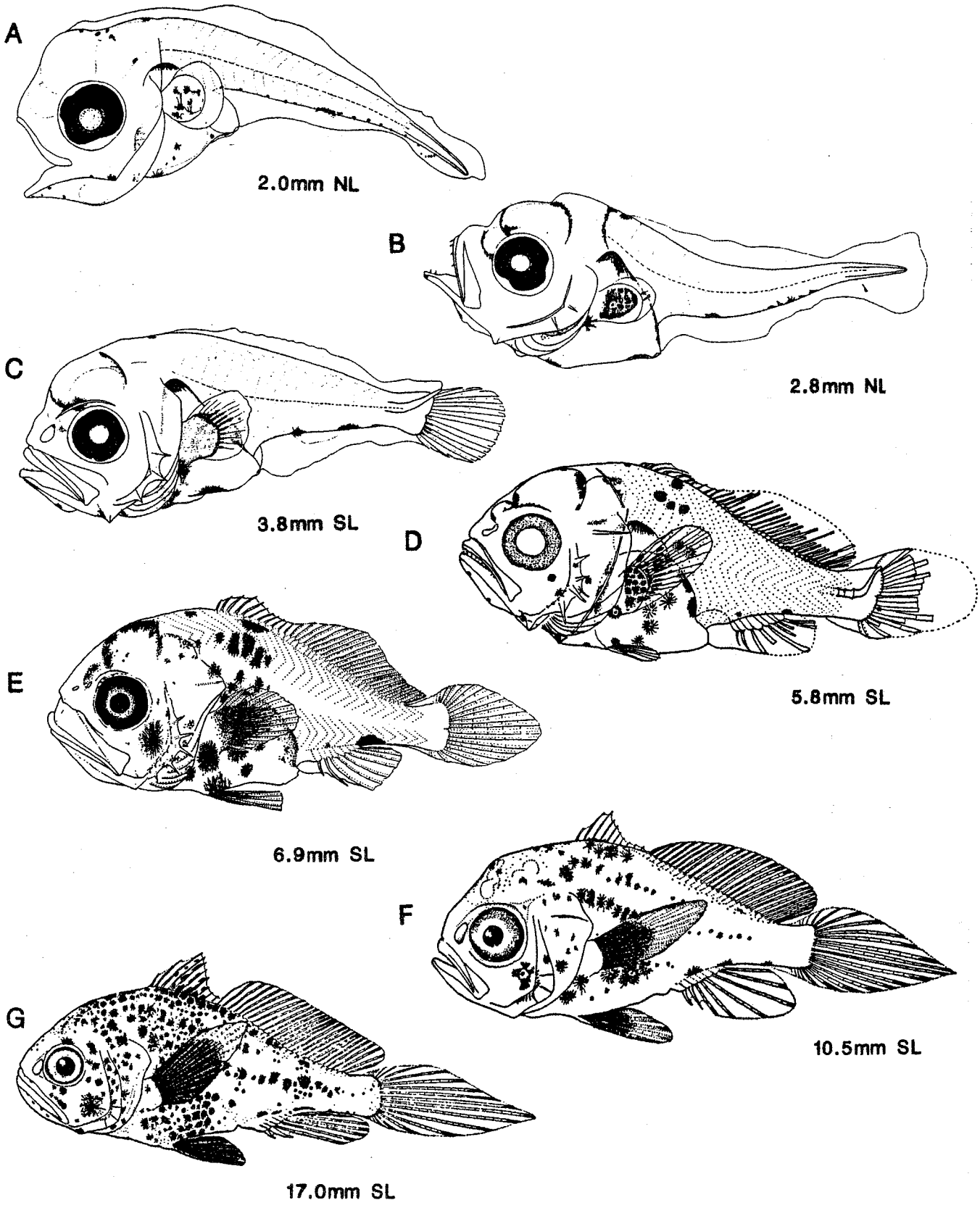
Literature: Miller and Jorgenson, 1973; Powles and Stender, 1978; Powles, 1980; Darovec, 1983; Ditty et al., 1988; Ditty, 1989.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: 3.1-4.2 mm
Length at transformation: probably about 10.0-12.0 mm
Sequence of fin development: caudal-anal-dorsal-pelvic-pectoral
Pigment: gular isthmus, anteriorly on fore- and mid-brain, nape, gut, pectoral fin, ventral midline of tail
Diagnostic: pectoral fin and brain pigment

Illustrations: A from Ditty, 1989; B Original; C from Ditty, 1989; D from Powles, 1980; E Original; F-H from Hildebrand and Cable, 1934.


A
2.0mm NL
B
2.8mm NL
C
3.8mm SL
D
5.8mm SL
E
6.9mm SL
F
10.5mm SL
G
17.0mm SL

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI(X-XII)
Second Dorsal	29-32(33-35)
Dorsal Finlets	0
Total Dorsal Elements	40-43(39-47)
Anal	II,12-13
Anal Finlets	0
Total Ventral Elements	14-15
Pectoral	21-22
Pelvic	I,5
Caudal	
Dorsal Secondary	6-8
Principal	9+8
Ventral Secondary	6-8
Total	29-32
Gillrakers on first arch	
Upper	8-12
Lower	20-24
Total	30-36
Branchiostegals	7

LIFE HISTORY

Range: U. S. Atlantic coast and Gulf of Mexico to Bay of Campeche, Mexico
Habitat: demersal, estuarine and coastal waters
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning: Season: late fall through winter
Area: continental shelf waters
Mode:
Migration: inshore-offshore

Literature: Hildebrand and Cable, 1930; Miller and Jorgensen, 1973; Fruge and Truesdale, 1978; Powles and Stender, 1978; Powell and Gordy, 1980; Darovec, 1983; Ditty et al., 1988; Ditty 1989.

EARLY LIFE HISTORY DESCRIPTION

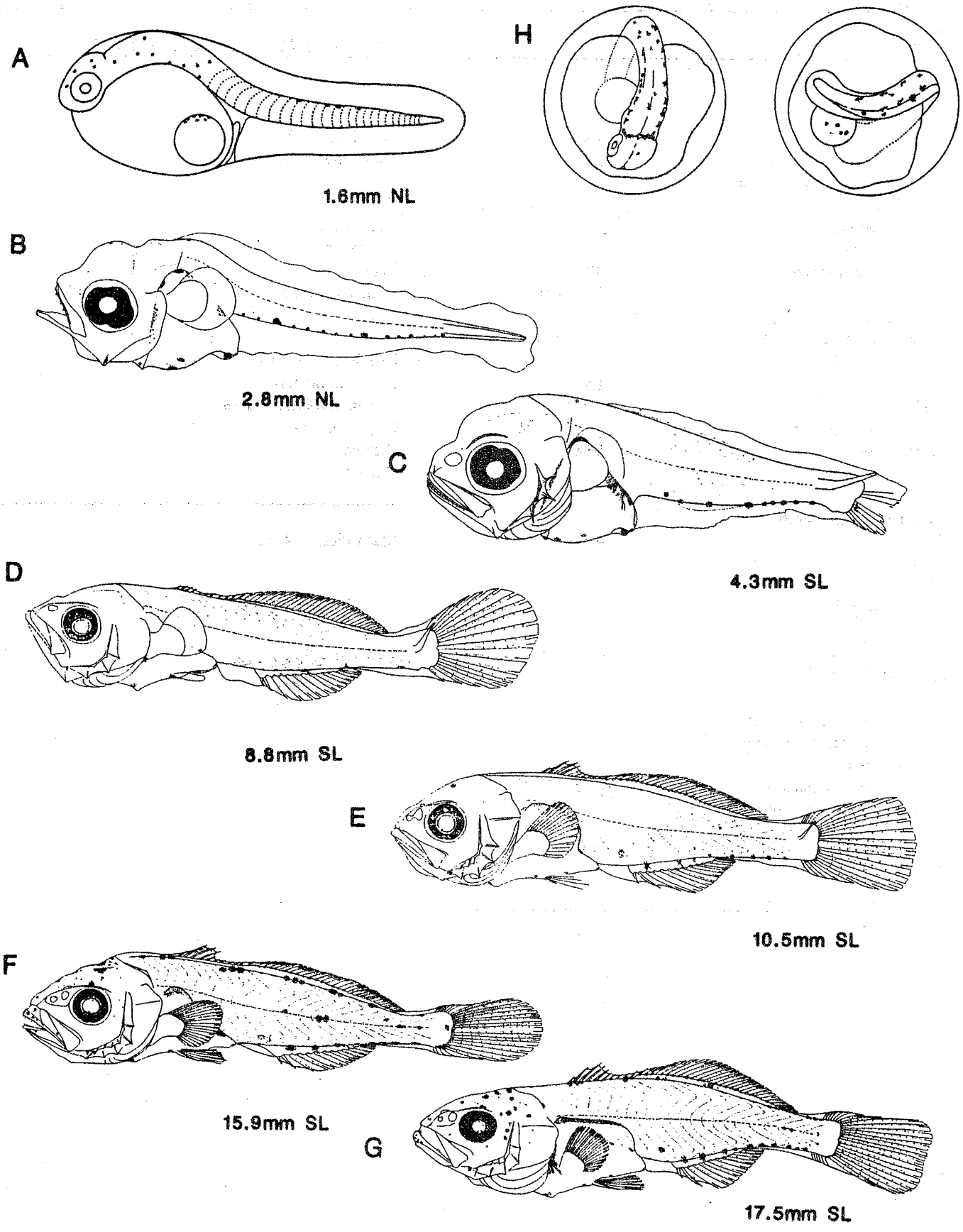
EGGS:
Diameter: 0.72-0.87 mm
No. of Oil Globules: varies depending on egg stage
Oil Globule Diameter: 0.18-0.28 mm (when one oil globule present)
Yolk: unsegmented, perivitelline space narrow
Shell: unsculptured
Hatch Size: 1.6-1.7 mm
Incubation: 48 hrs at 20°C
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: 4.3-4.8 mm
Length at transformation: 15.0 mm
Sequence of fin development: caudal-anal-dorsal-pelvic-pectoral
Pigment: dentary, nape, gut, anus-anal fin gap, anal fin origin and termination, mid-anal fin base
Diagnostic: position of enlarged postanal melanophore along ventral midline, lack of pigment in midline of gular isthmus between lower jaw rami, sparse dorsal and lateral pigment; from *Micropogonias* by pigment on anterior visceral mass between cleithra

Illustrations: A and H from Powell and Gordy, 1980; B-C from Ditty, 1989; D-G Original.

Leiostomus xanthurus

SCIAENIDAE



SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	11
Caudal	18
Total	29
Number of fin spines and rays	
First Dorsal	XI-XII
Second Dorsal	37-39
Dorsal Finlets	0
Total Dorsal Elements	48-51
Anal	II,8(7-9)
Anal Finlets	0
Total Ventral Elements	10(9-11)
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	4-6
Lower	11-13
Total	15-18
Branchiostegals	

LIFE HISTORY

Range: Venezuela to Brazil
Habitat: demersal, estuarine and coastal waters
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Chao, 1978.

Lonchurus lanceolatus (Bloch)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

Macrodon ancylodon (Bloch and Schneider)

MERISTICS

Vertebrae	
Precaudal	13
Caudal	12
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	27-30
Dorsal Finlets	0
Total Dorsal Elements	38-41
Anal	II,8-9(10)
Anal Finlets	0
Total Ventral Elements	10-11(12)
Pectoral	16
Pelvic	I,5
Caudal	
Dorsal Secondary	6-7
Principal	9+8
Ventral Secondary	6-7
Total	29-31
Gillrakers on first arch	
Upper	2-3
Lower	7-9
Total	9-12
Branchiostegals	

LIFE HISTORY

Range: Venezuela through Brazil
Habitat: demersal, estuarine and coastal waters <60 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Schultz, 1949; Miller and Jorgenson, 1973; Chao, 1978; Sinque, 1980.

EARLY LIFE HISTORY DESCRIPTION

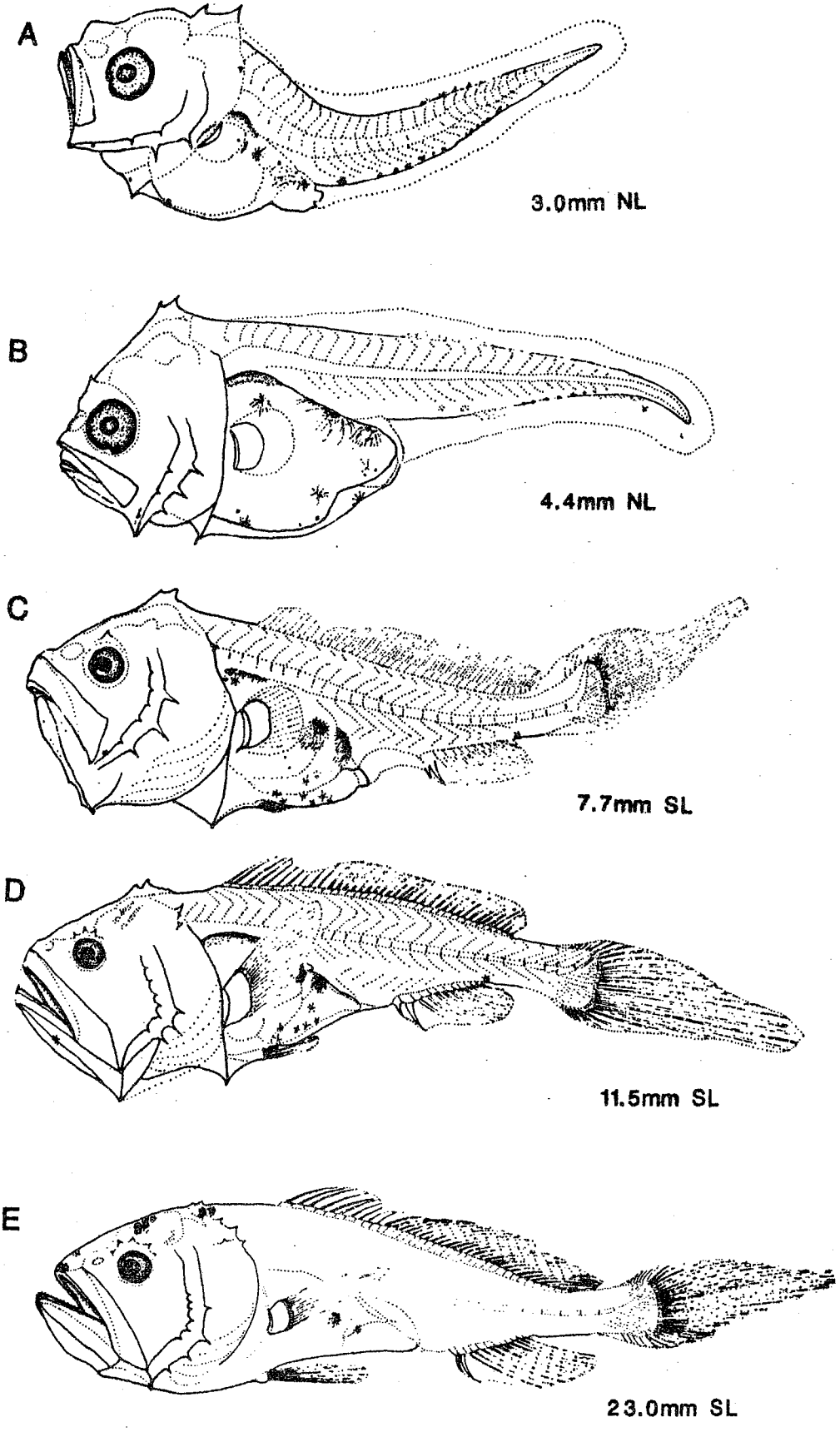
EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: A-E from Sinque, 1980.

Macrodon ancylodon

SCIAENIDAE



SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	22-26(20-21)
Dorsal Finlets	0
Total Dorsal Elements	33-37(31-32)
Anal	I,7(6-8)
Anal Finlets	0
Total Ventral Elements	8(7-9)
Pectoral	≥20(18-24)
Pelvic	I,5
Caudal	
Dorsal Secondary	8-9
Principal	9+8
Ventral Secondary	7
Total	32-33
Gillrakers on first arch	
Upper	2-3
Lower	0-7
Total	2-10
Branchiostegals	7

LIFE HISTORY

Range: throughout area except Lesser Antilles
Habitat: demersal, estuarine, surf zone and shallow coastal waters
ELH pattern: oviparous, pelagic larvae
Spawning: Season: spring and summer along U. S. coast
Area: coastal waters
Mode:
Migration:

Literature: Hildebrand and Cable, 1934; Bearden, 1963; Irwin, 1970; Miller and Jorgenson, 1973; Powles and Stender, 1978; Chao, 1978; Ditty, 1989.

Menticirrhus americanus (Linnaeus)

EARLY LIFE HISTORY DESCRIPTION

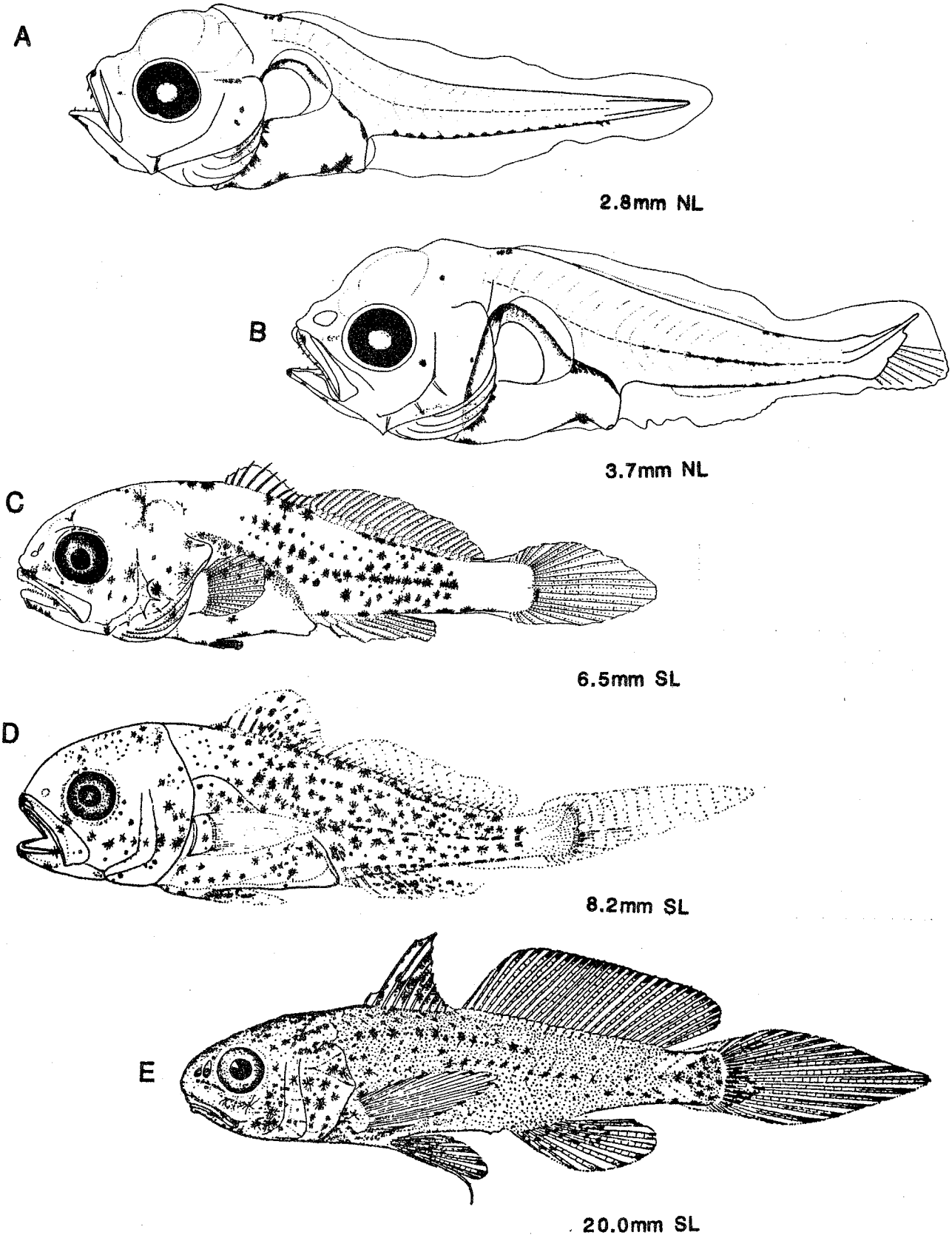
EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: unknown
Length at transformation: unknown
Sequence of fin development: unknown
Pigment: based on *Menticirrhus spp.*: palatines, multiple melanophores on nape, opercle, lower jaw, along gut, and dorsal, lateral, and ventral midlines
Diagnostic: from all but *C. nebulosus* by pigment on palatines; multiple melanophores on nape; lack of pigment anterior to cleithral symphysis

Illustrations: A-B from Ditty, 1989; C Original [pers. comm., Dr. J. L-Shultz, NMFS, Pascagoula Lab, Mississippi]; D from Sinque, 1980; E from Hildebrand and Cable, 1934.

Menticirrhus americanus

SCIAENIDAE



SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	22-25(21-26)
Dorsal Finlets	0
Total Dorsal Elements	33-36(32-37)
Anal	I,7(6-8)
Anal Finlets	0
Total Ventral Elements	8(7-9)
Pectoral	≤19(18-21)
Pelvic	I,5
Caudal	
Dorsal Secondary	7-8
Principal	9+8
Ventral Secondary	6
Total	30-31
Gillrakers on first arch	
Upper	3-5
Lower	0-8
Total	3-12
Branchiostegals	7

LIFE HISTORY

Range: throughout area except Greater and Lesser Antilles
Habitat: demersal, shallow coastal waters and surf zone
ELH pattern: oviparous, pelagic larvae
Spawning: Season: spring-summer along U. S. Atlantic and Gulf coasts
Area: coastal waters
Mode:
Migration:

Literature: Hildebrand and Cable, 1934; Irwin, 1970; Miller and Jorgensen, 1973; Powles and Stender, 1978; Chao, 1978; Ditty et al., 1988; Ditty, 1989.

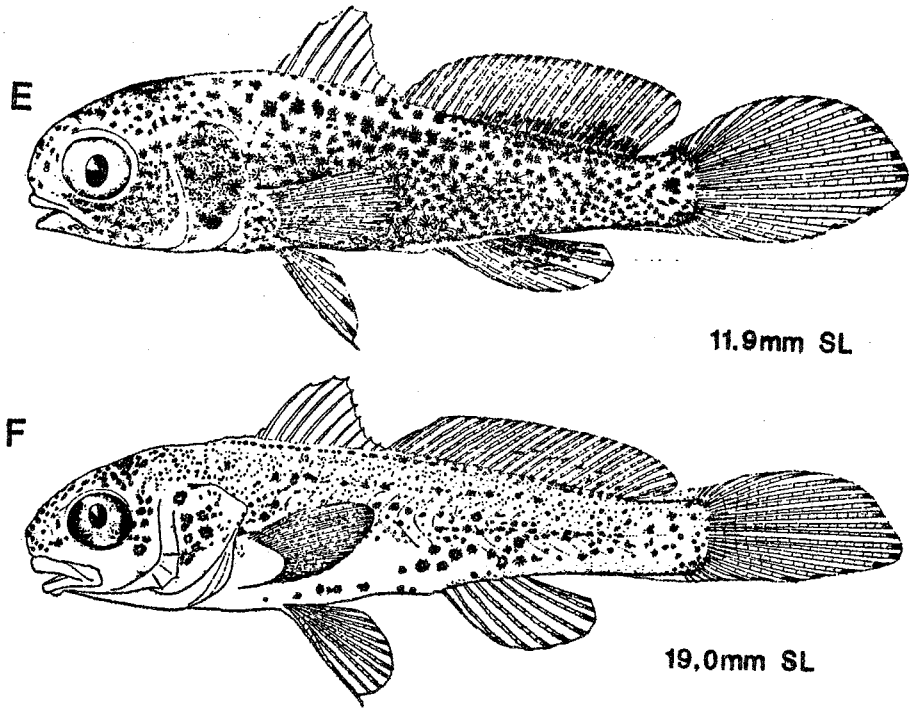
Menticirrhus littoralis (Holbrook)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: unknown
Length at transformation: unknown
Sequence of fin development: unknown
Pigment: based on *Menticirrhus spp.*: palatines, multiple melanophores on nape, opercle, lower jaw, along gut, and dorsal, lateral, and ventral midlines
Diagnostic: from all but *C. nebulosus* by pigment on palatines; multiple melanophores on nape; lack of pigment anterior to cleithral symphysis

Illustrations: E-F from Hildebrand and Cable, 1934.


E
11.9mm SL
F
19.0mm SL

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	23-25(22-27)
Dorsal Finlets	0
Total Dorsal Elements	34-36(33-38)
Anal	I,8(7-9)
Anal Finlets	0
Total Ventral Elements	10(9-11)
Pectoral	≥20(18-21)
Pelvic	I,5
Caudal	
Dorsal Secondary	6-8
Principal	9+8
Ventral Secondary	6
Total	29-31
Gillrakers on first arch	
Upper	3-5
Lower	0-7
Total	3-12
Branchiostegals	7

LIFE HISTORY

Range: U. S. Atlantic and Gulf of Mexico
Habitat: demersal, estuaries, surf zone, and shallow coastal waters
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning: Season: spring and summer along U. S. Atlantic and Gulf coasts
Area: coastal waters
Mode:
Migration:

Literature: Welsh and Breder, 1924; Hildebrand and Cable, 1934; Irwin, 1970; Miller and Jorgensen, 1973; Chao, 1978; Powles and Stender, 1978.

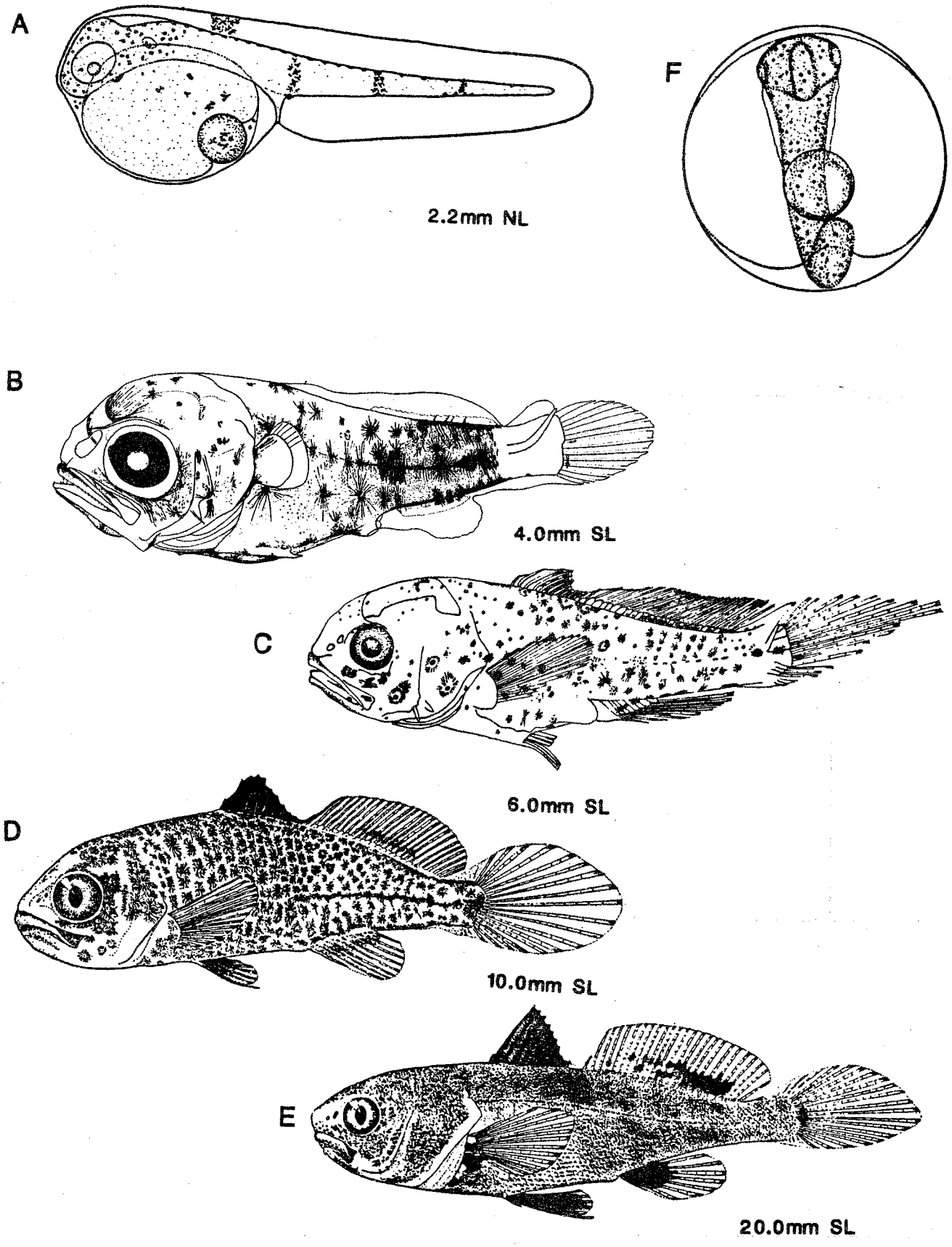
EARLY LIFE HISTORY DESCRIPTION

EGGS:
Diameter: 0.8-0.85 mm
No. of Oil Globules: varies depending on egg stage
Oil Globule Diameter: 0.19-0.26 mm (when single oil globule present)
Yolk:
Shell:
Hatch Size: 2.0 mm
Incubation: 46-50 hrs at 20-21°C
Pigment: embryo, oil globule, and yolk-sac
Diagnostic Characters:

LARVAE:
Length at flexion: unknown
Length at transformation: probably about 10.0-12.0 mm
Sequence of fin development: unknown
Pigment: based on *Menticirrhus spp.*: palatines, multiple melanophores on nape, opercle, lower jaw, along gut, and dorsal, lateral, and ventral midlines
Diagnostic: from all but *C. nebulosus* by pigment on palatines; multiple melanophores on nape; lack of pigment anterior to cleithral symphysis

Illustrations: A and G from Welsh and Breder (1924); C from Ditty (1989) [pers. comm., Dr. J. L-Shultz, NMFS, Pascagoula Lab, Mississippi]; D from Jannke (1971); E-F from Hildebrand and Cable (1934).

Menticirrhus saxatilis SCIAENIDAE



SCIAENIDAE

Micropogonias furnieri (Demarest)

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	26-28(26-30)
Dorsal Finlets	0
Total Dorsal Elements	37-39(40-41)
Anal	II,7-8
Anal Finlets	0
Total Ventral Elements	9-10
Pectoral	17-19
Pelvic	I,5
Caudal	
Dorsal Secondary	9-10
Principal	9+8
Ventral Secondary	7-9
Total	33-36
Gillrakers on first arch	
Upper	7-9
Lower	12-15
Total	24-25(21-25)
Branchiostegals	

LIFE HISTORY

Range: Antilles, and Costa Rica south
Habitat: demersal, estuarine and coastal waters <60 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Schultz, 1949; Miller and Jorgenson, 1973; Chao, 1978; Sinque, 1980; Cervigon et al., 1993.

EARLY LIFE HISTORY DESCRIPTION

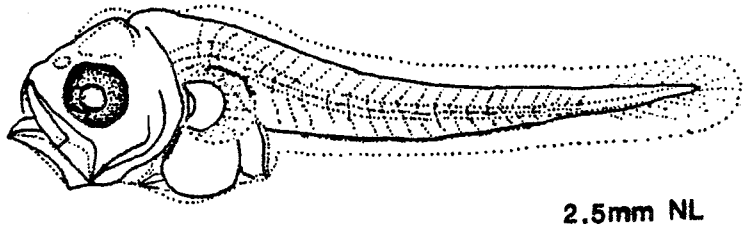
EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: A-F from Sinque, 1980.

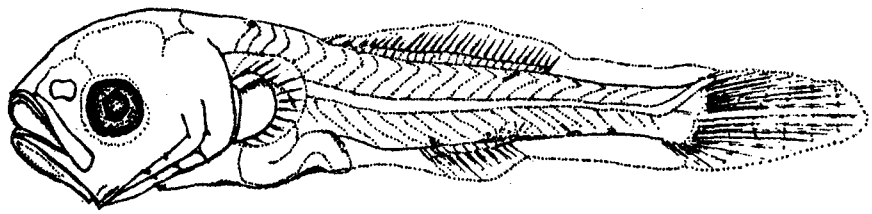
Micropogonias furnieri SCIAENIDAE

A



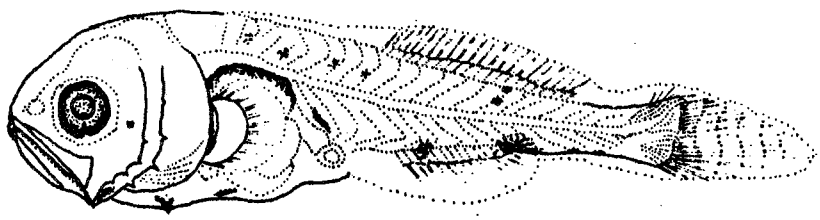
2.5mm NL

B



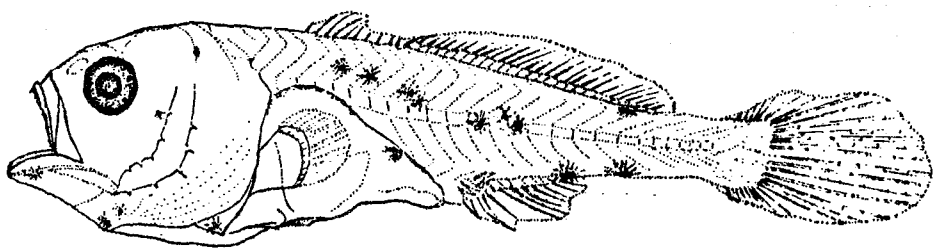
5.4mm SL

C



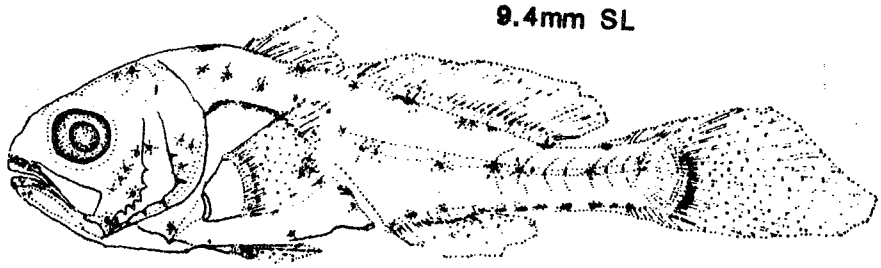
6.8mm SL

D



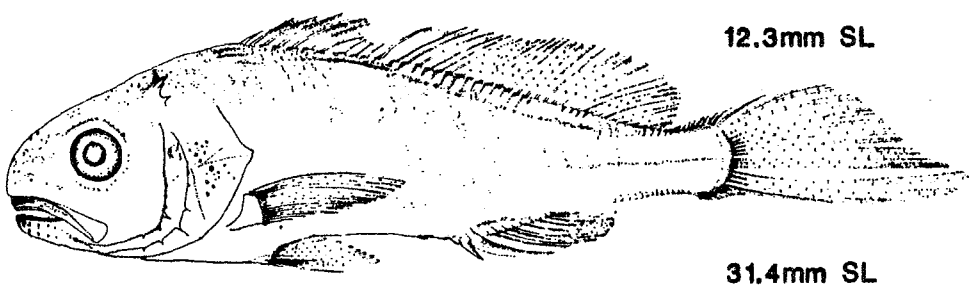
9.4mm SL

E



12.3mm SL

F



31.4mm SL

SCIAENIDAE

Micropogonias undulatus (Linnaeus)

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	28-29(26-31)
Dorsal Finlets	0
Total Dorsal Elements	39-40(38-41)
Anal	II,8(7-9)
Anal Finlets	0
Total Ventral Elements	10-11(9)
Pectoral	17-18
Pelvic	I,5
Caudal	
Dorsal Secondary	8-9
Principal	9+8
Ventral Secondary	8
Total	33-34
Gillrakers on first arch	
Upper	8-10
Lower	14-18
Total	23-26(22-28)
Branchiostegals	7

LIFE HISTORY

Range: U. S. Atlantic and Gulf coasts to Bay of Campeche, Mexico
Habitat: demersal, estuarine and coastal waters <100 m
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning: Season: fall and winter
Area: offshore over continental shelf
Mode:
Migration: none

Literature: Hildebrand and Cable, 1930; Miller and Jorgenson, 1973; Fruge and Truesdale, 1978; Powles and Stender, 1978; Darovec, 1983; Ditty et al., 1988; Ditty, 1989.

EARLY LIFE HISTORY DESCRIPTION

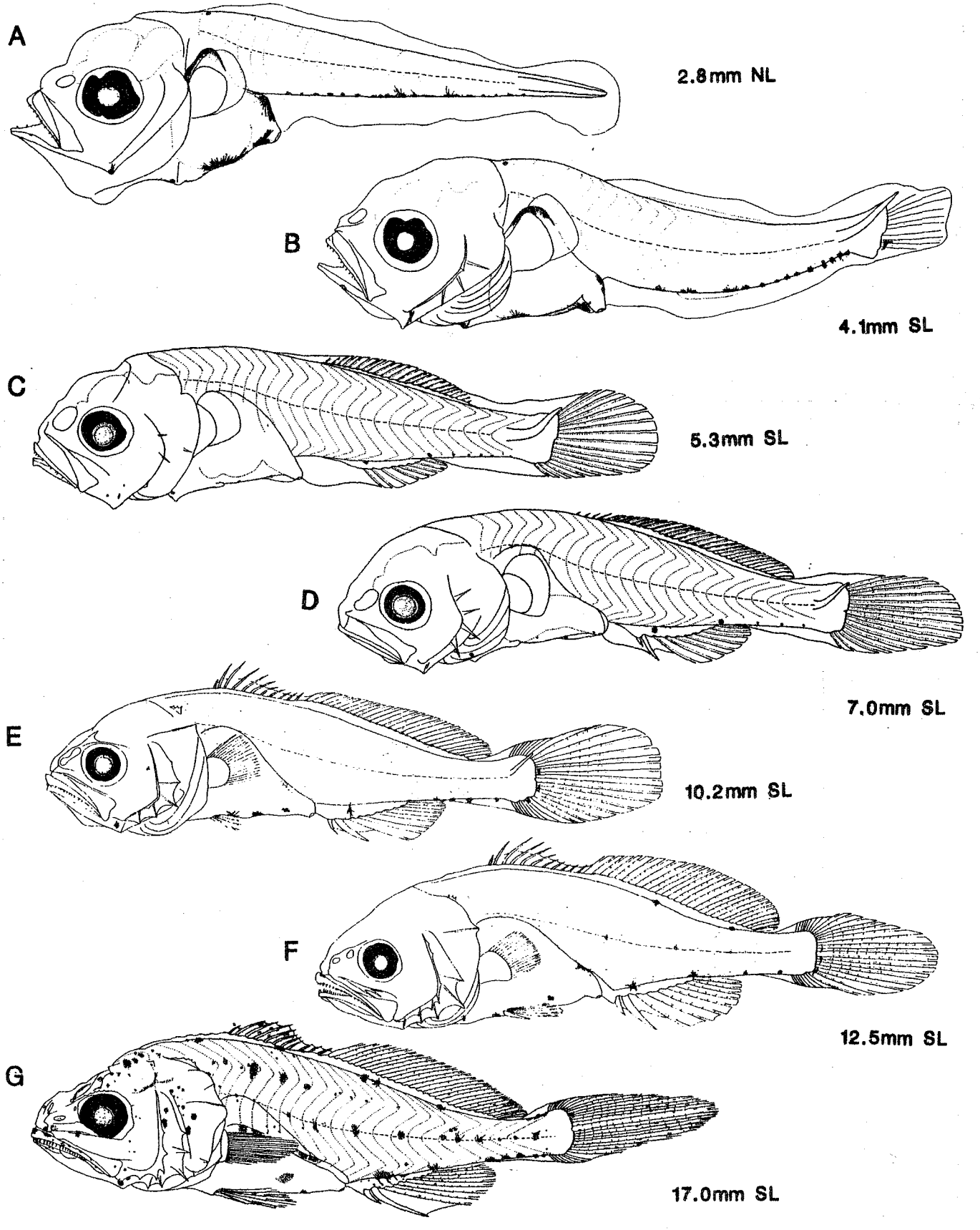
EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: 3.8-4.5 mm
Length at transformation: about 12.0 mm
Sequence of fin development: caudal-dorsal and anal-pelvic-pectoral
Pigment: dentary, nape, over gut, and along ventral midline of tail: enlarged melanophore located in anus-anal fin gap, at anal fin origin, and at anal fin termination
Diagnostic: lack of pigment on anterior visceral mass between cleithra, position of enlarged postanal melanophores along ventral midline of tail

Illustrations: A-B from Ditty, 1989; C-H Original.

Micropogonias undulatus

SCIAENIDAE



SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	12
Caudal	13
Total	25
Number of fin spines and rays	
First Dorsal	VIII-IX
Second Dorsal	31-33(28-34)
Dorsal Finlets	0
Total Dorsal Elements	39-41(36-43)
Anal	II,9-10
Anal Finlets	0
Total Ventral Elements	11-12
Pectoral	16-18
Pelvic	I,5
Caudal	
Dorsal Secondary	8-9
Principal	9+8
Ventral Secondary	6-8
Total	31-34
Gillrakers on first arch	
Upper	5-9
Lower	14-15
Total	20-24
Branchiostegals	

LIFE HISTORY

Range: Costa Rica to Brazil
Habitat: demersal, estuarine and coastal waters <50 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Fowler, 1944; Cervigon, 1966; Miller and Jorgenson, 1973; Chao, 1978.

Nebris microps Cuvier

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Nebris microps

SCIAENIDAE

SCIAENIDAE

Odontoscion dentex (Cuvier)

MERISTICS

Vertebrae	
Precaudal	12
Caudal	13
Total	25
Number of fin spines and rays	
First Dorsal	XII-XIII
Second Dorsal	22-27
Dorsal Finlets	0
Total Dorsal Elements	35-39
Anal	II,8-9(10)
Anal Finlets	0
Total Ventral Elements	10-12
Pectoral	13-15
Pelvic	I,5
Caudal	
Dorsal Secondary	9-11
Principal	9+8
Ventral Secondary	9
Total	35-37
Gillrakers on first arch	
Upper	5-9
Lower	14-17
Total	19-25
Branchiostegals	

LIFE HISTORY

Range: South Florida, Gulf of Mexico, Greater and Lesser Antilles, and Costa Rica to Brazil
Habitat: demersal, coral reef and hard bottom areas
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Cervigon, 1966; Miller and Jorgenson, 1973; Chao, 1978; Darovec, 1983.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Odontoscion dentex SCIAENIDAE

SCIAENIDAE

Ophioscion punctatissimus Meek and Hildebrand

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	23-24
Dorsal Finlets	0
Total Dorsal Elements	34-35
Anal	II,6-7
Anal Finlets	0
Total Ventral Elements	8-9
Pectoral	18
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	7-8
Lower	13-16
Total	20-24
Branchiostegals	

LIFE HISTORY

Range: Panama to Brazil
Habitat: demersal, shallow coastal waters
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Cervigon, 1966: Chao, 1978.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	11
Caudal	18
Total	29
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	28-31
Dorsal Finlets	0
Total Dorsal Elements	39-42
Anal	II,8(7-9)
Anal Finlets	0
Total Ventral Elements	10(9-11)
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	6
Principal	9+8
Ventral Secondary	5-7
Total	28-30
Gillrakers on first arch	
Upper	3-5
Lower	6-9
Total	10-14
Branchiostegals	

LIFE HISTORY

Range: Panama to Brazil
Habitat: demersal, estuarine and coastal waters <50 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Miller and Jorgenson, 1973; Chao, 1978.

Paralonchurus brasiliensis (Steindachner)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Paralonchurus brasiliensis SCIAENIDAE

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	31-33
Dorsal Finlets	0
Total Dorsal Elements	42-44
Anal	II,7
Anal Finlets	0
Total Ventral Elements	9
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	3-4
Lower	4-8
Total	7-11
Branchiostegals	

LIFE HISTORY

Range: Surinam to Brazil
Habitat: demersal, estuarine and coastal waters <25 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Chao, 1978.

Paralonchurus elegans Boeseman

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	X-XI
Second Dorsal	36-41
Dorsal Finlets	0
Total Dorsal Elements	46-52
Anal	II,7-8(6)
Anal Finlets	0
Total Ventral Elements	9-10(8)
Pectoral	16-17
Pelvic	I,5
Caudal	
Dorsal Secondary	7-8
Principal	9+8
Ventral Secondary	6-7
Total	30-32
Gillrakers on first arch	
Upper	5-6
Lower	9-14
Total	14-20
Branchiostegals	

LIFE HISTORY

Range: throughout area
Habitat: demersal, coral reef and hard bottom coastal waters
ELH pattern: oviparous, probably benthic
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Longley and Hildebrand, 1941; Miller and Jorgensen, 1973; Chao, 1978; Powles and Stender, 1978.

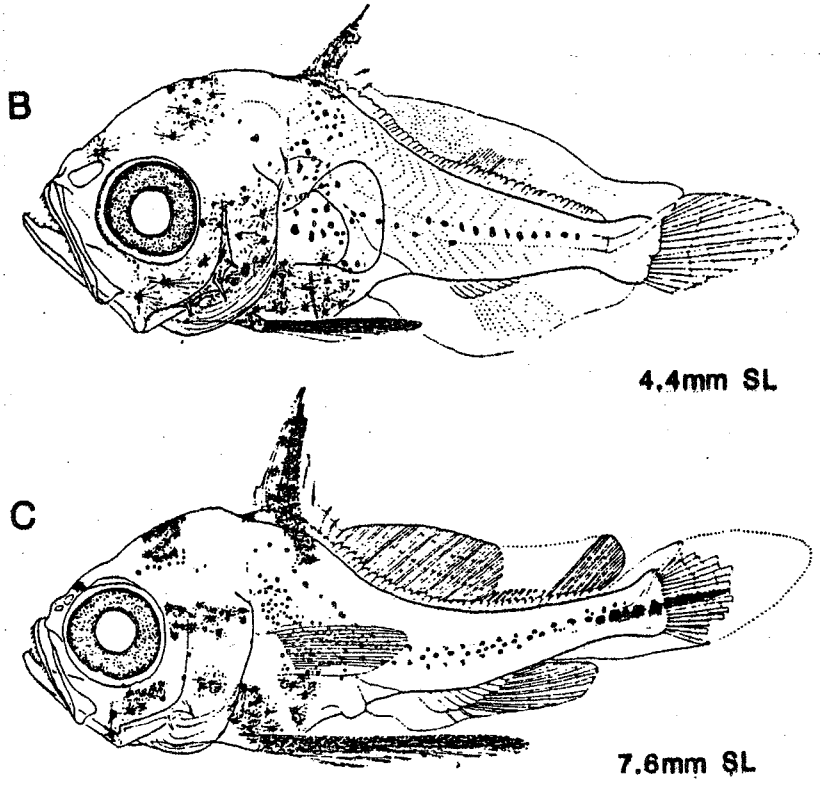
Pareques acuminatus (Bloch and Schneider)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: B-C from Powles and Burgess, 1978 (*Pareques sp.*).


B
4.4mm SL
C
7.6mm SL

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI(X-XII)[1]
Second Dorsal	38(33-40)[1]
Dorsal Finlets	0
Total Dorsal Elements	
Anal	II,7(8)
Anal Finlets	0
Total Ventral Elements	9(10)
Pectoral	17(15-18)
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8-9
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	6(4-7)
Lower	12(9-11)
Total	19(15-18)
Branchiostegals	6-7

LIFE HISTORY

Range: North Carolina through Gulf of Mexico, and Caribbean to Brazil
Habitat: demersal, reef and hard bottom areas from 37-184 m deep
ELH pattern: oviparous, benthic larvae
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Powles and Burgess, 1978; Miller and Woods, 1988.

[1] dorsal fins nearly separate

Pareques iwamotoi Miller and Woods

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

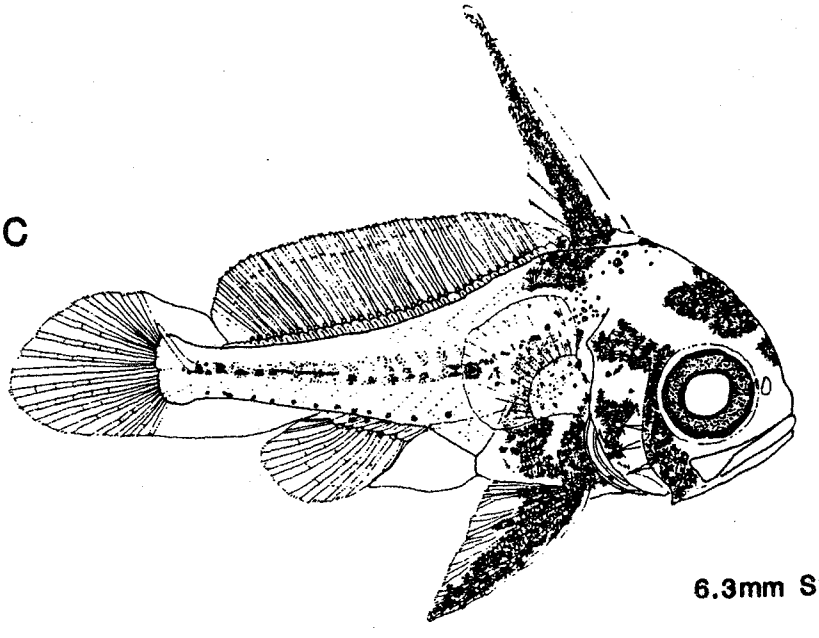
LARVAE:
Length at flexion: unknown
Length at transformation: unknown
Sequence of fin development: unknown
Pigment: head, abdomen, lateral midline, first dorsal and pelvic fins
Diagnostic: precocious, elongate first dorsal and pelvic fins; heavily-pigmented head, abdomen, and fins

Illustrations: C from Powles and Burgess, 1978.

Pareques iwamotoi

SCIAENIDAE

C



6.3mm SL

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	IX-XI
Second Dorsal	38-40(37-42)
Dorsal Finlets	0
Total Dorsal Elements	47-51(46-53)
Anal	II,7(6-8)
Anal Finlets	0
Total Ventral Elements	9
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	7-8
Principal	9+8
Ventral Secondary	7
Total	31-32
Gillrakers on first arch	
Upper	4-6
Lower	10-12
Total	15-18
Branchiostegals	

LIFE HISTORY

Range: U. S. Atlantic coast and Gulf of Mexico
Habitat: demersal, continental shelf waters
ELH pattern: oviparous, probably benthic larvae
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Miller and Jorgenson, 1973; Chao, 1978; Darovec, 1983.

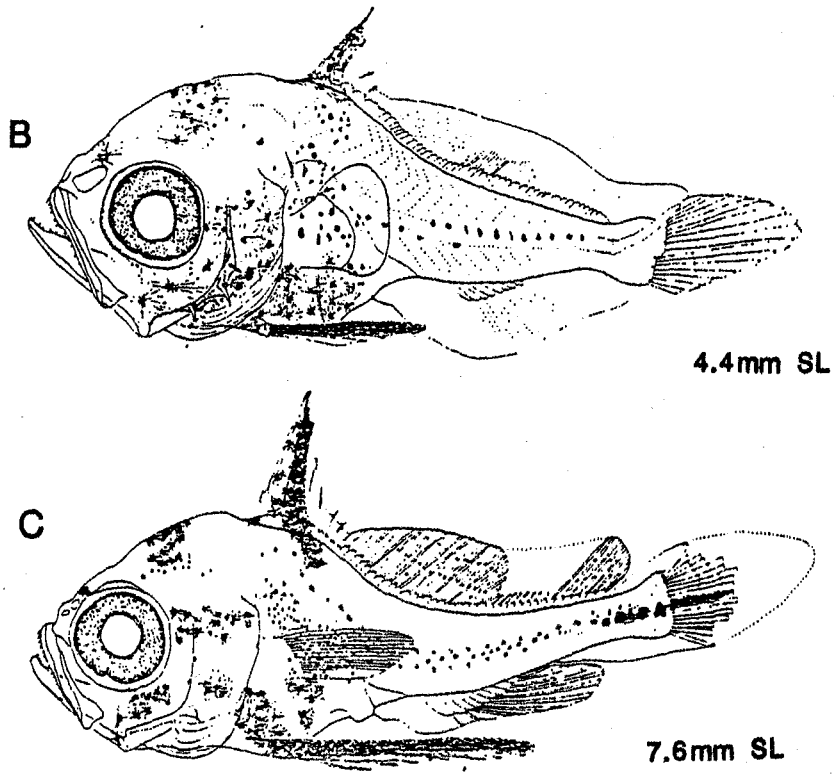
Pareques umbrosus (Jordan and Eigenmann)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: B-C from Powles and Burgess, 1978 (*Pareques sp.*).


B
4.4mm SL
C
7.6mm SL

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	14
Total	24
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	21-23(19-23)
Dorsal Finlets	0
Total Dorsal Elements	32-33(30-34)
Anal	II,6(5-7)
Anal Finlets	0
Total Ventral Elements	8(7-9)
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	8-9
Principal	9+8
Ventral Secondary	7
Total	32-33
Gillrakers on first arch	
Upper	4-6
Lower	12-16
Total	16-21
Branchiostegals	7

LIFE HISTORY

Range: U. S. Atlantic and Gulf coasts
Habitat: demersal, estuarine and continental shelf waters
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning: Season: December to March in Gulf of Mexico, March to May along U. S. Atlantic coast
Area: neritic waters near mouth of bays and passes
Mode:
Migration: inshore-offshore

Literature: Joseph et al., 1964; Miller and Jorgenson, 1973; Powles and Stender, 1978; Holt et al., 1988; Ditty et al., 1988; Alshuth and Gilmore, 1992.

Pogonias cromis (Linnaeus)

EARLY LIFE HISTORY DESCRIPTION

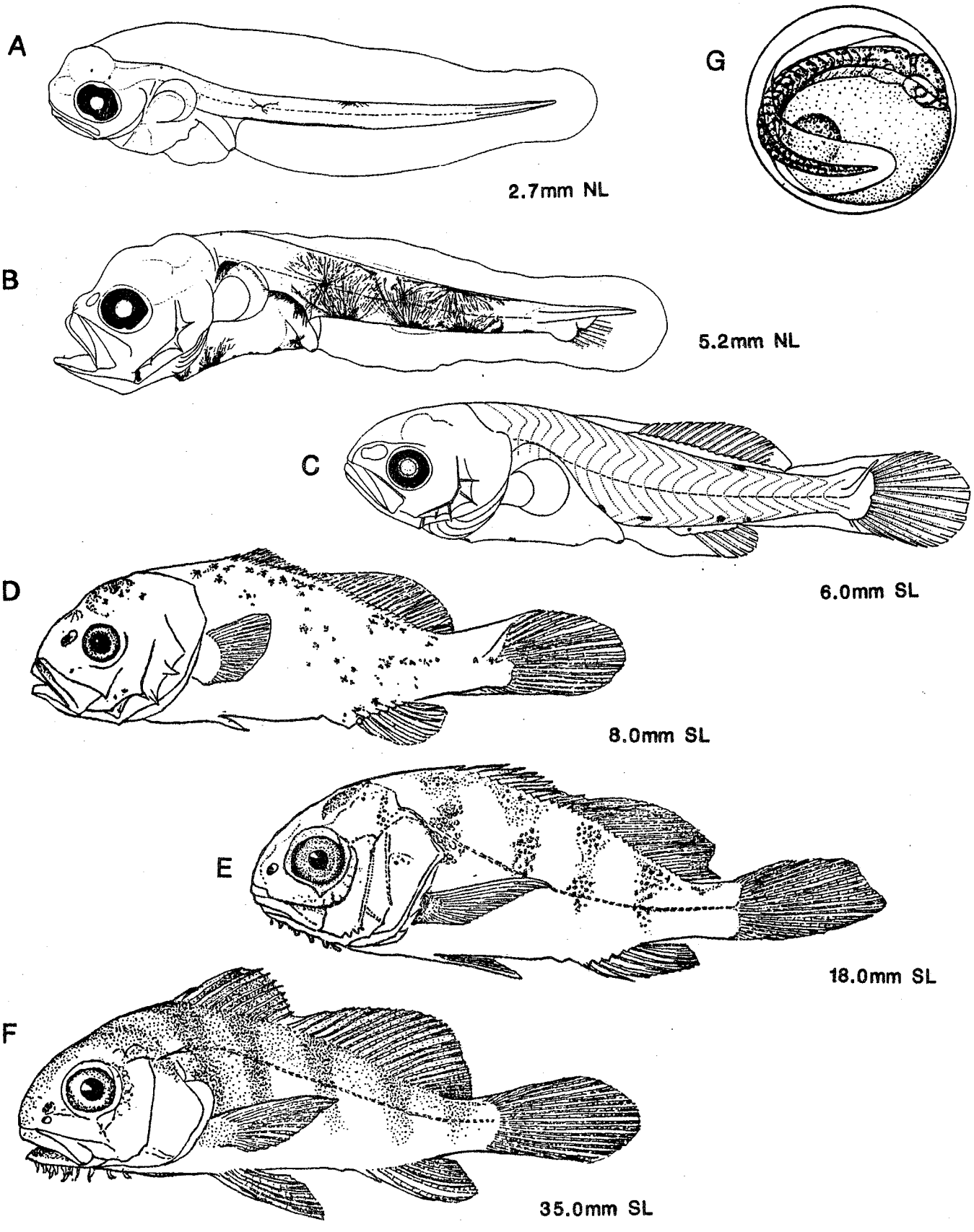
EGGS:
Diameter: 0.8-1.1 mm; mean: 0.9 mm
No. of Oil Globules: varies with egg stage
Oil Globule Diameter: 0.22-0.26 mm, mean: 0.24 mm (when single oil globule present)
Yolk:
Shell:
Hatch Size: 2.0-2.4 mm
Incubation: 24 hrs at 20°C
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: 4.0-5.0 mm
Length at transformation: probably about 12.0 mm
Sequence of fin development:
Pigment: dentary, nape, along gut, dorsal and ventral midlines
Diagnostic: position of enlarged melanophores along dorsal and ventral midline; from *Sciaenops* by lack of pigment at soft dorsal fin origin

Illustrations: A-B from Ditty, 1989; C Original; D-F from Pearson, 1929; G from Joseph et al., 1964.

Pogonias cromis

SCIAENIDAE



MERISTICS

Vertebrae	
Precaudal	11
Caudal	14
Total	25
Number of fin spines and rays	
First Dorsal	X-XI
Second Dorsal	21-23
Dorsal Finlets	0
Total Dorsal Elements	31-34
Anal	II,7
Anal Finlets	0
Total Ventral Elements	9
Pectoral	15-18
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	8(7-9)
Lower	16(14-19)
Total	24(22-27)
Branchiostegals	

LIFE HISTORY

Range: Panama to eastern Venezuela, and Trinidad
Habitat: demersal, deep offshore waters primarily >180 m and continental slope
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Chao and Miller, 1975.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	25(24-26)
Dorsal Finlets	0
Total Dorsal Elements	35-37
Anal	II,7
Anal Finlets	0
Total Ventral Elements	9
Pectoral	16(15-17)
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	6(7)
Lower	13-15
Total	19-21
Branchiostegals	

LIFE HISTORY

Range: western Columbia to central Venezuela
Habitat: demersal, offshore waters >70 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Chao and Miller, 1975.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

Sciaenops ocellata (Linnaeus)

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	24-25(23)
Dorsal Finlets	0
Total Dorsal Elements	34-36
Anal	II,8(7-9)
Anal Finlets	0
Total Ventral Elements	9-11
Pectoral	17
Pelvic	I,5
Caudal	
Dorsal Secondary	8-10
Principal	9+8
Ventral Secondary	7-9
Total	32-36
Gillrakers on first arch	
Upper	4-5
Lower	7-9
Total	12-14
Branchiostegals	7

LIFE HISTORY

Range: U. S. Atlantic and Gulf coasts to northern Mexico
Habitat: demersal, estuarine and continental shelf waters
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning: Season: fall along U. S. Atlantic and Gulf coasts
Area: neritic waters near mouth of bays and passes
Mode:
Migration: inshore-offshore

Literature: Pearson, 1929; Topp and Cole, 1968; Miller and Jorgenson, 1973; Powles and Stender, 1978; Holt et al., 1981; Ditty et al., 1988; Ditty, 1989.

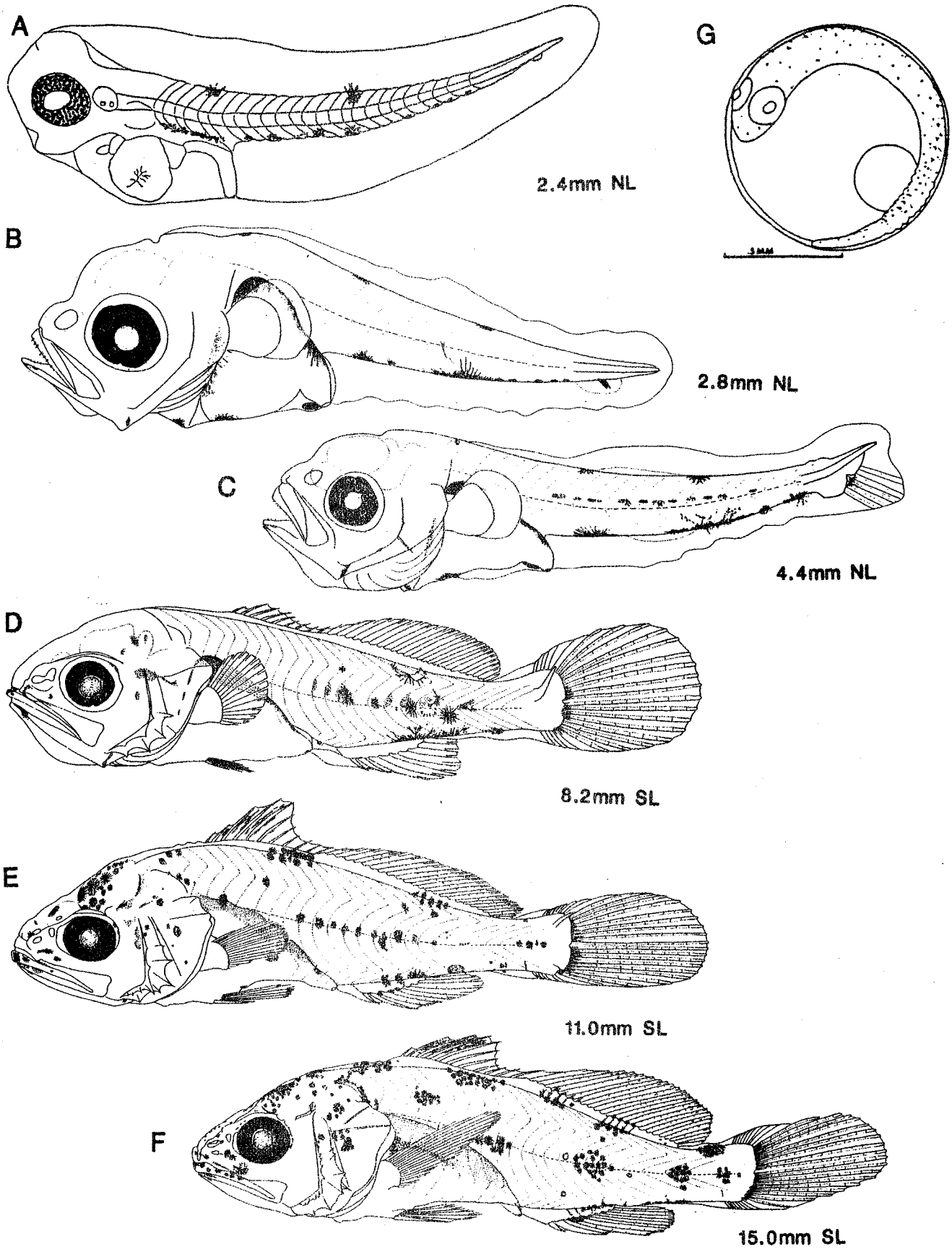
EARLY LIFE HISTORY DESCRIPTION

EGGS:
Diameter: 0.86-0.98 mm (mean: 0.93 mm)
No. of Oil Globules: varies with age
Oil Globule Diameter: 0.22-0.36 mm (mean: 0.30 mm) (when single oil globule present)
Yolk:
Shell: clear and unsculptured
Hatch Size: 1.7-1.8 mm
Incubation: 28-29 hrs at 22-23°C
Pigment: scattered over oil globule and embryo
Diagnostic Characters:

LARVAE:
Length at flexion: 4.0-5.0 mm
Length at transformation: probably about 12.0 mm
Sequence of fin development: caudal-dorsal and anal-pelvic-pectoral
Pigment: nape, dentary, along gut, dorsal and ventral midlines, internal above notochord
Diagnostic: position of enlarged melanophores along dorsal and ventral midlines; from *Pogonias* by melanophore at origin of soft dorsal fin

Illustrations: A and G from Holt et al., 1981; B-C from Ditty, 1989; D-F Original.

Sciaenops ocellata



SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XII
Second Dorsal	23-24
Dorsal Finlets	0
Total Dorsal Elements	35-36
Anal	II,8-9
Anal Finlets	0
Total Ventral Elements	10-11
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	
Lower	
Total	37-41
Branchiostegals	

LIFE HISTORY

Range: Venezuela
Habitat: demersal
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Chao, 1978.

Stellifer sp. A

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Stellifer sp. A

SCIAENIDAE

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XIII
Second Dorsal	20
Dorsal Finlets	0
Total Dorsal Elements	33
Anal	II,8-9
Anal Finlets	0
Total Ventral Elements	10-11
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	11-12
Lower	18-21
Total	30-33
Branchiostegals	

LIFE HISTORY

Range: French Guiana and northern Brazil
Habitat: demersal
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Chao, 1978.

Stellifer sp. B

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Stellifer sp. B

SCIAENIDAE

SCIAENIDAE

Stellifer brasiliensis (Schultz)

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	21-22
Dorsal Finlets	0
Total Dorsal Elements	32-33
Anal	II,9
Anal Finlets	0
Total Ventral Elements	11
Pectoral	18-19
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	8
Lower	14-16
Total	22-24
Branchiostegals	

LIFE HISTORY

Range: Brazil
Habitat: demersal, estuarine and coastal waters
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Schultz, 1945; Chao, 1978.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XII
Second Dorsal	23(22-24)
Dorsal Finlets	0
Total Dorsal Elements	34-36
Anal	II,8-9
Anal Finlets	0
Total Ventral Elements	10-11
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	10-12
Lower	19-22
Total	29-33
Branchiostegals	

LIFE HISTORY

Range: Panama, Puerto Rico, and Haiti
Habitat: demersal, coral reef and hard bottom areas
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Meek and Hildebrand, 1925; Chao, 1978.

Stellifer colonensis Meek and Hildebrand

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI-XII
Second Dorsal	21-23
Dorsal Finlets	0
Total Dorsal Elements	
Anal	II,8-9
Anal Finlets	0
Total Ventral Elements	10-11
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	20-23
Lower	32-36
Total	53-55
Branchiostegals	

LIFE HISTORY

Range: Venezuela and Trinidad
Habitat: demersal, coastal waters <50 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Cervigon, 1966: Chao, 1978.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XII-XIII
Second Dorsal	20-24
Dorsal Finlets	0
Total Dorsal Elements	33-36
Anal	II,8-9
Anal Finlets	0
Total Ventral Elements	10-11
Pectoral	19-20
Pelvic	I,5
Caudal	
Dorsal Secondary	7-9
Principal	9+8
Ventral Secondary	6-9
Total	30-35
Gillrakers on first arch	
Upper	10-13
Lower	22-23
Total	32-36
Branchiostegals	7

LIFE HISTORY

Range: Chesapeake Bay through Gulf of Mexico
Habitat: demersal, coastal waters <20 m
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning Season: April-October in Gulf of Mexico
Area: coastal waters
Mode:
Migration:

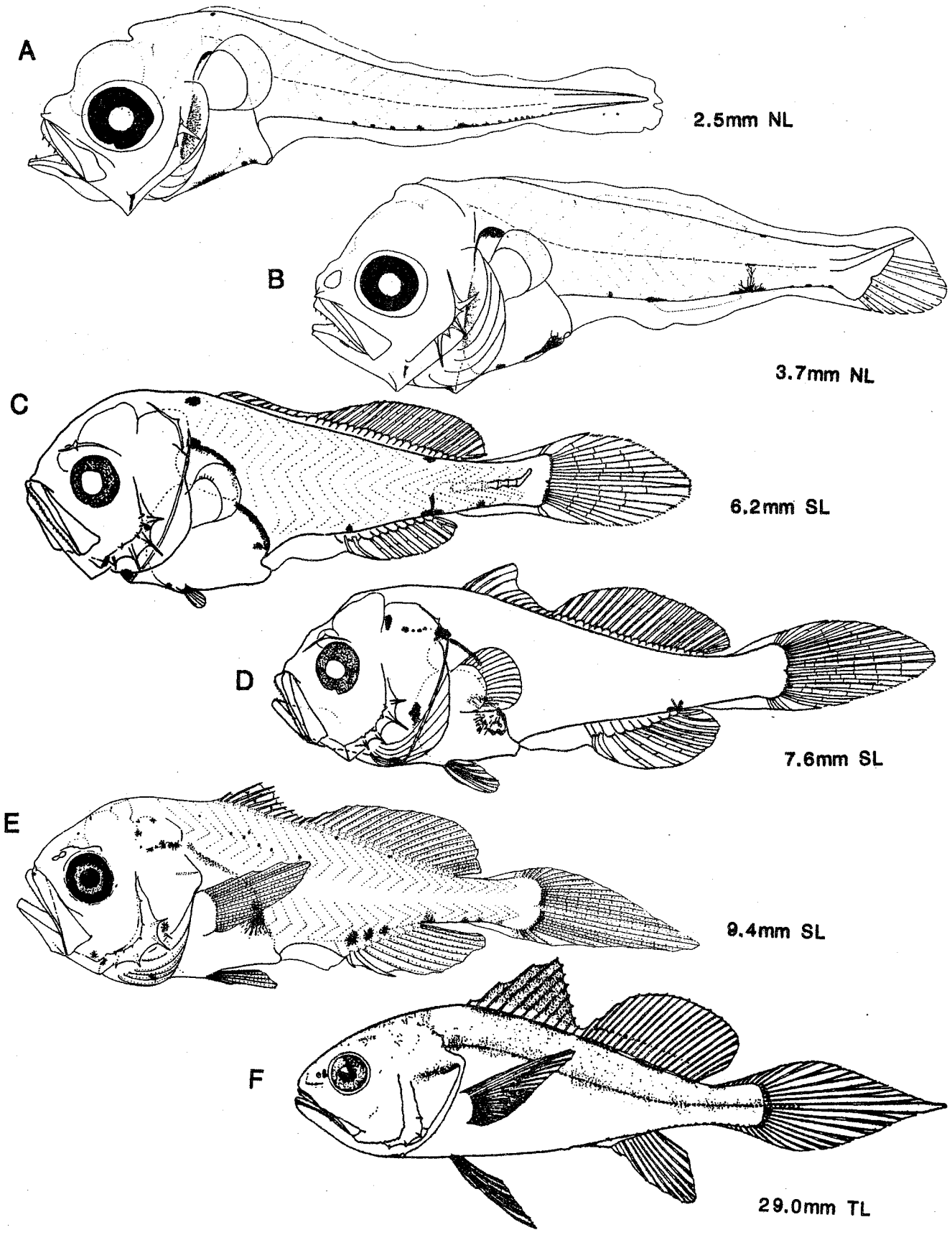
Literature: Hildebrand and Cable, 1934; Miller and Jorgenson, 1973; Powles and Stender, 1978; Powles, 1980; Ditty et al., 1988; Ditty, 1989.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: 3.3-4.4 mm
Length at transformation: about 12.0 mm
Sequence of fin development: caudal-dorsal and anal-pelvic-pectoral
Pigment: dentary, nape, over gut, along ventral midline of tail, pigment in dorsal midline above termination of anal fin base
Diagnostic: location of enlarged melanophore along ventral midline of tail; from *Cynoscion* by lack of melanophore along gular isthmus between lower jaw rami

Illustrations: A-B from Ditty, 1989; C-D from Powles, 1980; E Original; F from Hildebrand and Cable, 1934.


A
2.5mm NL
B
3.7mm NL
C
6.2mm SL
D
7.6mm SL
E
9.4mm SL
F
29.0mm TL

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI-XII
Second Dorsal	19-21
Dorsal Finlets	0
Total Dorsal Elements	30-33
Anal	II,9(8-10)
Anal Finlets	0
Total Ventral Elements	11(10-12)
Pectoral	18-20
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	7-9
Lower	13-16
Total	20-24
Branchiostegals	

LIFE HISTORY

Range: Columbia to Brazil, and West Indies
Habitat: demersal, estuarine and coastal waters <30 m
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Schultz, 1945; Cervigon, 1966: Chao, 1978.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Stellifer microps SCIAENIDAE

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XII
Second Dorsal	20-22
Dorsal Finlets	0
Total Dorsal Elements	32-34
Anal	II,8
Anal Finlets	0
Total Ventral Elements	10
Pectoral	18
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	8-9
Lower	15-16
Total	23-25
Branchiostegals	

LIFE HISTORY

Range: Venezuela to Brazil
Habitat: demersal, estuaries and coastal waters
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Schultz, 1945; Chao, 1978.

Stellifer naso (Jordan)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XI-XIII
Second Dorsal	21-23
Dorsal Finlets	0
Total Dorsal Elements	
Anal	II,9(8)
Anal Finlets	0
Total Ventral Elements	10-11
Pectoral	18-20
Pelvic	I,5
Caudal	
Dorsal Secondary	7-10
Principal	9+8
Ventral Secondary	7-9
Total	33-36
Gillrakers on first arch	
Upper	16-18(16-21)
Lower	24-28(23-30)
Total	41-44(40-50)
Branchiostegals	

LIFE HISTORY

Range: Venezuela to Brazil
Habitat: demersal, estuaries and shallow coastal waters
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Schultz, 1949; Cervigon, 1966: Miller and Jorgenson, 1973; Chao, 1978; Sinque, 1980.

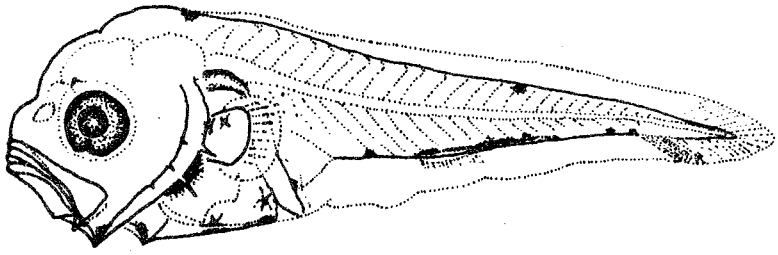
EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

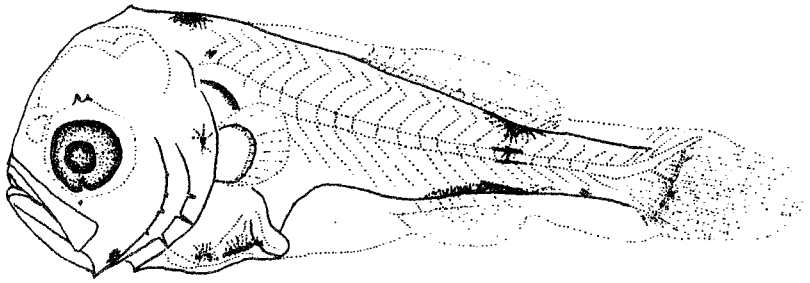
Illustrations: A-E from Sinque, 1980.

A



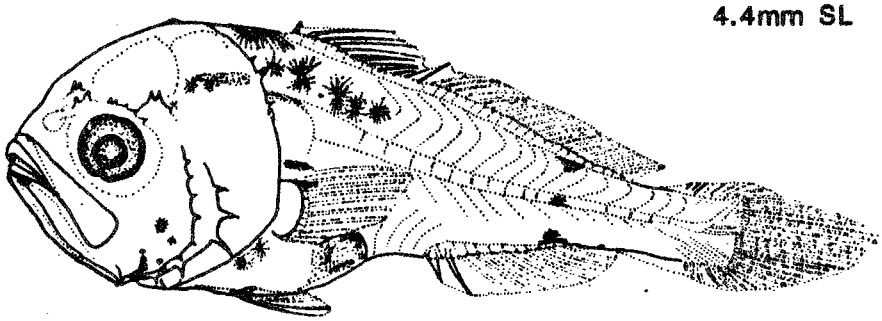
3.5mm NL

B



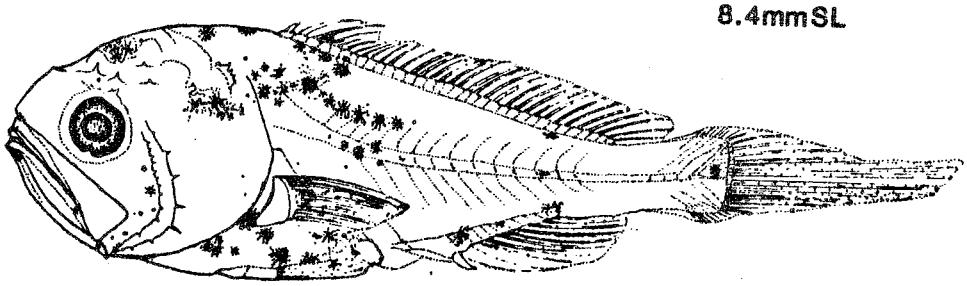
4.4mm SL

C



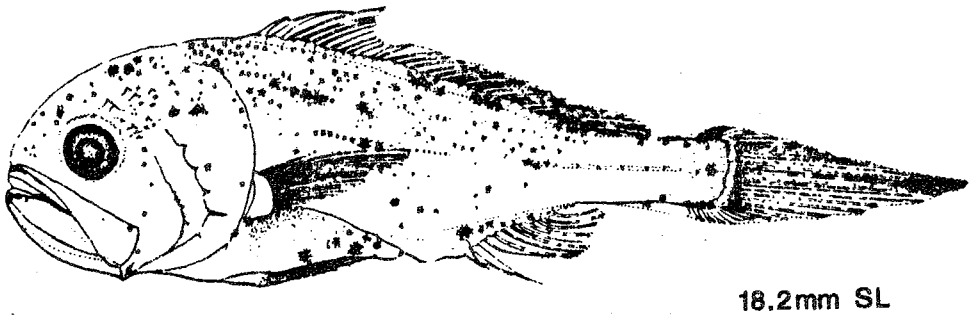
8.4mmSL

D



12.9mm SL

E



18.2mm SL

SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XII
Second Dorsal	18-20
Dorsal Finlets	0
Total Dorsal Elements	30-32
Anal	II,8
Anal Finlets	0
Total Ventral Elements	10
Pectoral	
Pelvic	I,5
Caudal	
Dorsal Secondary	9
Principal	9+8
Ventral Secondary	8
Total	34
Gillrakers on first arch	
Upper	12-14
Lower	20-25
Total	32-38
Branchiostegals	

LIFE HISTORY

Range: Panama to Brazil
Habitat: demersal, estuaries and coastal waters
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Meek and Hildebrand, 1925; Chao, 1978.

Stellifer stellifer (Bloch)

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

MERISTICS

Vertebrae	
Precaudal	10
Caudal	15
Total	25
Number of fin spines and rays	
First Dorsal	XII-XIII
Second Dorsal	21-22
Dorsal Finlets	0
Total Dorsal Elements	
Anal	II,8(9)
Anal Finlets	0
Total Ventral Elements	10-11
Pectoral	18-19
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	9-10
Lower	16-19
Total	26-28
Branchiostegals	

LIFE HISTORY

Range: Venezuela
Habitat: demersal, estuaries and coastal waters
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Schultz, 1945; Chao, 1978.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

MERISTICS

Vertebrae	
Precaudal	11
Caudal	14
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	24-25(23-26)
Dorsal Finlets	0
Total Dorsal Elements	35-36(34-37)
Anal	II,6
Anal Finlets	0
Total Ventral Elements	8
Pectoral	16(15)
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	5-7
Lower	7-10
Total	13-15
Branchiostegals	6

LIFE HISTORY

Range: Costa Rica to Columbia and Antilles, except Cuba
Habitat: demersal, shallow sandy beach areas
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Gilbert, 1966; Miller, 1971; Chao, 1978.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Umbrina broussonneti SCIAENIDAE

MERISTICS

Vertebrae	
Precaudal	11
Caudal	14
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	27-29(26-31)
Dorsal Finlets	0
Total Dorsal Elements	38-40(37-42)
Anal	II,6
Anal Finlets	0
Total Ventral Elements	8
Pectoral	17(16-18)
Pelvic	I,5
Caudal	
Dorsal Secondary	8-9
Principal	9+8
Ventral Secondary	7-8
Total	24-25
Gillrakers on first arch	
Upper	5-7
Lower	7-10
Total	13-15
Branchiostegals	6

LIFE HISTORY

Range: western Gulf of Mexico south to Yucatan penisula of Mexico; Atlantic coast of Florida, Greater Antilles, and Panama to Venezuela
Habitat: demersal, shallow coastal areas along beaches, sometimes coral reef areas
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

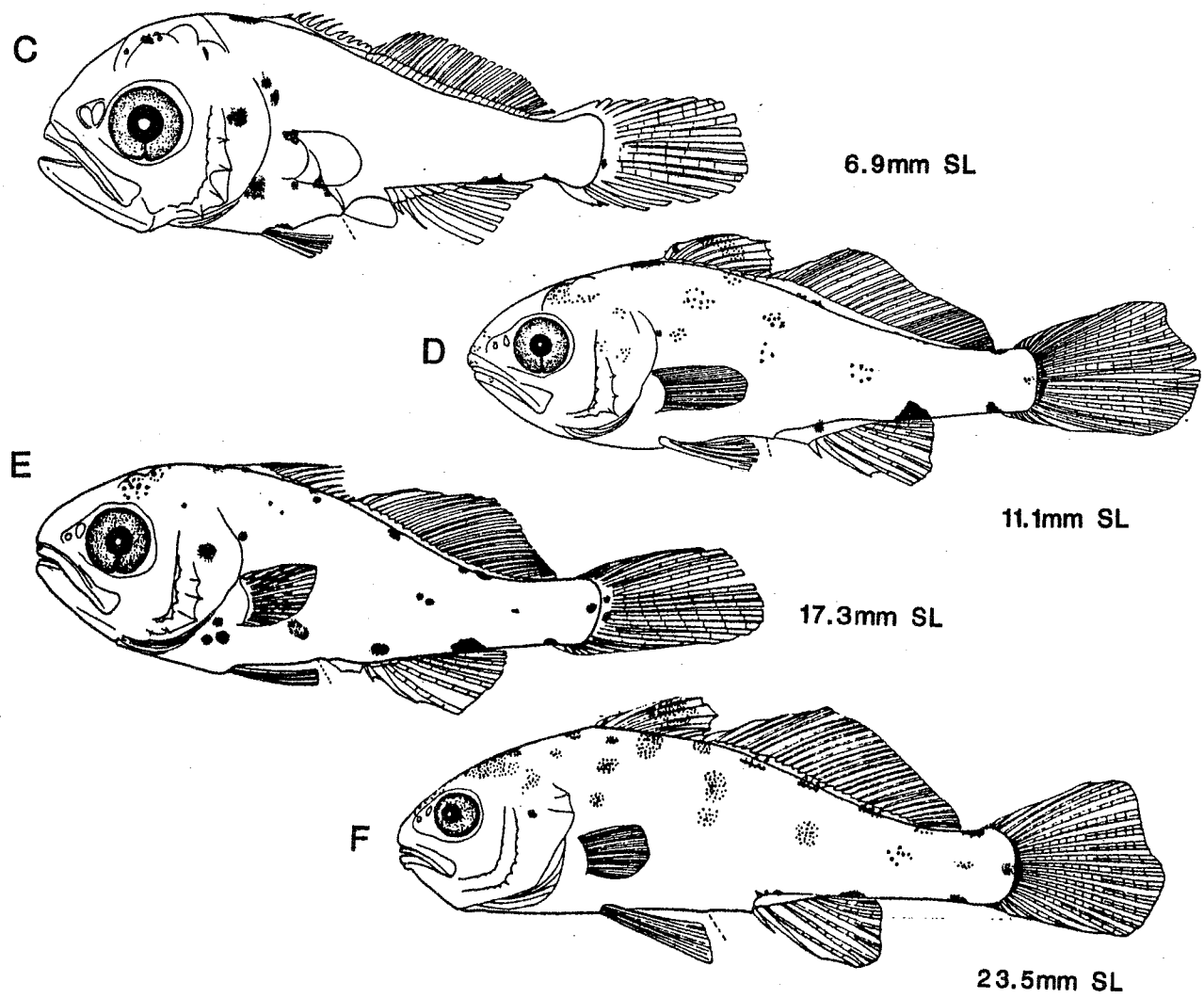
Literature: Gilbert, 1966; Miller, 1971; Powles and Stender, 1978; Matsuura and Nakatani, 1979.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE:
Length at flexion: unknown
Length at transformation: probably 10.0-12.0 mm
Sequence of fin development: unknown
Pigment: head, abdomen, and ventral midline of tail
Diagnostic:

Illustrations: C-F from Matsuura and Nakatani, 1979.


C
6.9mm SL
D
E
11.1mm SL
17.3mm SL
F
23.5mm SL

MERISTICS

Vertebrae	
Precaudal	11
Caudal	14
Total	25
Number of fin spines and rays	
First Dorsal	XI
Second Dorsal	22-23
Dorsal Finlets	0
Total Dorsal Elements	33-34
Anal	II,7-8
Anal Finlets	0
Total Ventral Elements	9-10
Pectoral	18
Pelvic	I,5
Caudal	
Dorsal Secondary	
Principal	9+8
Ventral Secondary	
Total	
Gillrakers on first arch	
Upper	7-8
Lower	11-13
Total	19-20
Branchiostegals	6

LIFE HISTORY

Range: Columbia and adjacent Caribbean Sea
Habitat: demersal, mostly deep water
ELH pattern: oviparous
Spawning: Season: unknown
Area:
Mode:
Migration:

Literature: Miller, 1971; Chao, 1978.

EARLY LIFE HISTORY DESCRIPTION

EGGS: unknown
Diameter:
No. of Oil Globules:
Oil Globule Diameter:
Yolk:
Shell:
Hatch Size:
Incubation:
Pigment:
Diagnostic Characters:

LARVAE: unknown
Length at flexion:
Length at transformation:
Sequence of fin development:
Pigment:
Diagnostic:

Illustrations: None

Umbrina milliae

SCIAENIDAE

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