

## Lampridiformes

Selected meristic characters in species belonging to the order Lampridiformes whose adults or larvae have been collected in the study area. Classification sequence follows Olney *et al.* (1993). Caudal fin rays given as total number of rays or number of rays in upper lobe + number of rays in lower lobe, if applicable. Sources: Olney (1984); Olney (2002).

Family <i>Species</i>	Vertebrae	Dorsal Fin Rays	Anal Fin Rays	Pectoral Fin Rays	Pelvic Fin Rays	Caudal Fin Rays
<b>Lamprididae</b>						
<i>Lampris guttatus</i>	46	48–52	33–42	21–24	13–17	30–32
<b>Stylophoridae</b>						5–6 + 2 (elongate)
<i>Stylophorus chordatus</i>	50–53	115–124	14–17	10–11	1	
<b>Lophotidae</b>						
<i>Lophotus lacepede</i>	124–153	206–263	12–20	14–17	5	16–17
<i>Eumecichthys fiski</i>	151–200	310–392	5–9	13–15	0 or 2–3	12–13
<b>Radiicephalidae</b>						
<i>Radiicephalus elongatus</i>	114–121	150–160	6–7	9–10	9	4–5 + 6–7
<b>Trachipteridae</b>						
<i>Desmodema polystictum</i>	71–74	120–124	0	12–14	0	7–10
<i>Trachipterus arcticus</i>	99–102	150–190	0	9–11	5–7	8 + 5–6
<i>Zu cristatus</i>	62–69	120–150	0	10–12	3–7	8–12 + 1–5
<b>Regalecidae</b>						
<i>Regalecus glesne</i>	143–151	260–412	0	12–13	1 spine + 1 ray	3–4

## Lampridiformes

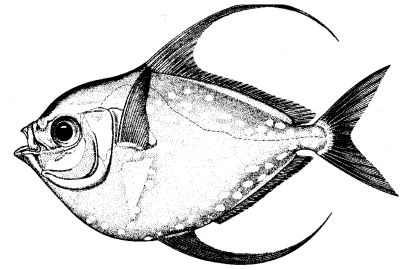
Lampridiforms are oceanic fishes that may reach spectacular proportions, with silvery bodies and flowing, highly colorful fin rays. Some have been the source of "sea serpent" sightings. Most are widely distributed throughout the world's oceans, but are infrequently observed or collected. Some species are best known from specimens stranded on beaches. Despite their rarity, early life history stages are fairly well-known. The eggs or larvae of 7 of 9 species known to occur in the study area have been described at some level.

Monophyly of the order has been established, based on the shared possession of four characters, all observable in early stages (Olney *et al.*, 1993). Three of these characters are associated with the unique jaw mechanism, wherein the maxilla slides forward with the premaxilla during jaw protrusion. The fourth shared character is the insertion of the first dorsal fin pterygiophore anterior to the first neural spine. Species in the family Veliferidae have not been reported from the present study area. Members of the six families that do occur in the study area share the following six characters, in addition to the four above (Olney *et al.*, 1993):

1. Large, pelagic eggs with reddish brown chorions
2. First pectoral fin radial fused to scapula, while remaining 3 are autogenous
3. Absence of an uncinat process on first epibranchial
4. Absence of autogenous pelvic fin radials
5. More than 40 total vertebrae
6. Second, third and fourth pharyngobranchials columnar, oblique, and have small posteroventral toothplates

Other characters found in the early stages of all, or most, lampridiforms include the following (after Olney *et al.*, 1993; Charter and Moser 1996d):

- Eggs of some species are equipped with spinules covering the chorion
- Embryos are precocious, with pigmented eyes, functional mouths and well-formed anterior dorsal and pelvic fin rays
- Elongate fin rays have pigmented swellings along their length in some species
- Head is typically compressed and deep, sometimes flexed downward
- Body tapers in most, often to a filamentous tip
- Eyes are typically large
- Dorsal fin is long-based with many rays; in other fins the ray numbers vary widely between families (see Table of Meristic Characters); some fins are absent in certain taxa
- Anterior dorsal fin rays have lateral spinules, visible in early stages of some species
- Caudal and pelvic fin rays, or lateral line scales, bear spines in some taxa
- Posterior part of dorsal fin may be delayed in development; the caudal peduncle elongates to accommodate the continued formation of dorsal fin rays late in the larval stage
- Caudal fin in some is in 2 parts; an unspecialized upper lobe (often bent upwards) and a lower lobe with several elongate rays
- Transformation is gradual and protracted; there are no distinct metamorphic stages

***Lampris guttatus* (Brünnich, 1788)****Lampridae****Opah**

**Range:** Worldwide in temperate and tropical waters; in the western North Atlantic from Grand Bank to Bahamas and Gulf of Mexico

**Habitat:** Epi- and mesopelagic in depths to 400 m

**Spawning:** Undescribed

**Eggs:** – Undescribed; ovarian eggs have thick chorion with amber tint

**Larvae:**

- Size at hatching undescribed, but mouth parts well-developed, protrusible; yolk mostly depleted
- Anterior dorsal and pelvic fin rays well-formed at hatching
- Preanus length 50–60% SL
- Very elongate ascending process of premaxilla
- Swellings along fin rays (present in certain other lampridiforms) not present
- Body slender initially, rapidly becomes very deep; body form of adult attained early (about 10–11 mm)
- A predorsal element and 1 dorsal fin pterygiophore insert into first interneural space (a different pattern is found in other lampridiform taxa in study area)
- Sequence of fin ray formation: D, P<sub>2</sub> – C – P<sub>1</sub>, A
- Fin rays completely developed at small size; pectoral fin rays form last, are complete by 10.6 mm
- Pectoral fin base rotates to horizontal position by 10 mm
- Caudal fin rays complete by about 8 mm, form of fin is symmetrical
- Pigmentation includes an early forming scattering of spots over the head and dorsum of gut; later stages characterized by dense covering of melanophores over most of body
- Transformation to juvenile stage is gradual

**Meristic Characters**

Myomeres:	about 46
Vertebrae:	46
Dorsal fin rays:	48–52
Anal fin rays:	33–42
Pectoral fin rays:	21–24
Pelvic fin rays:	13–17
Caudal fin rays:	30–32

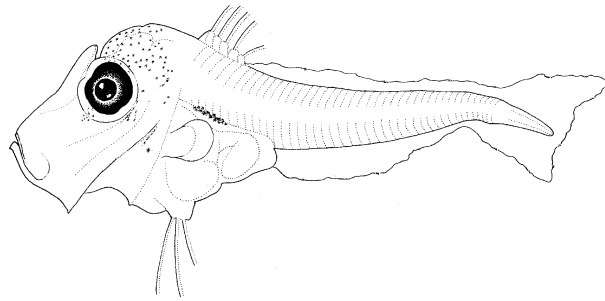
**Note:**

1. Vertebral and dorsal fin ray counts low compared to other lampridiforms; however, anal, pectoral, pelvic and caudal fin ray counts are higher
2. With clearing and staining, other important characters may be discerned; see introductory pages
3. Adult locomotion is *via* pectoral swimming, facilitated by sickle-shaped fins and massive muscles attached to enlarged shoulder girdle; these adaptations may be noticeable in young stages

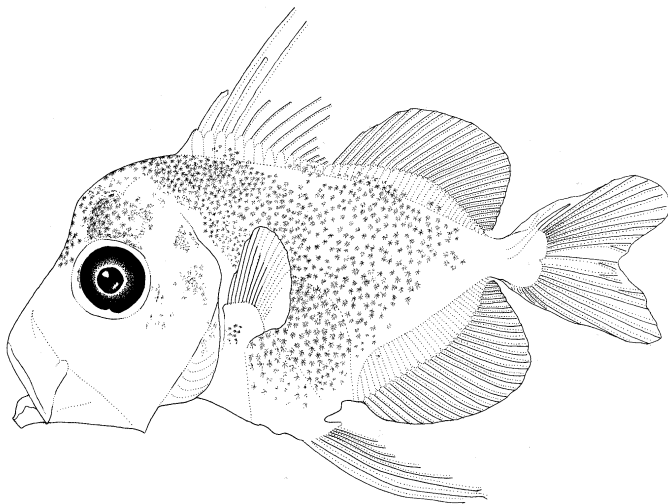
**Figures:** Adult: Palmer, 1986; A–C: Betsy Washington (Olney, 1984)

**References:** Rosenblatt and Johnson, 1976; Olney, 1984; Olney *et al.*, 1993

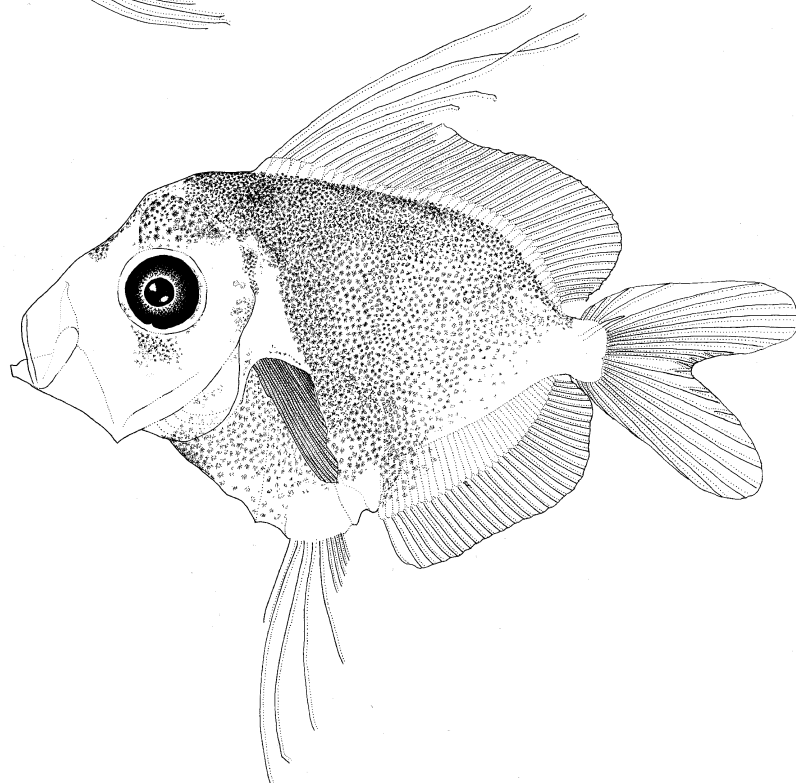
*Lampris guttatus*



**A. 4.7 mmSL**



**B. 8.6 mmSL**



**C. 10.6 mmSL**

***Stylophorus chordatus* Shaw, 1791****Stylophoridae****Tube eye**

**Range:** Worldwide in temperate and tropical waters; in the western Atlantic typically between 25°N and 16°S, but a few records as far north as 40°N (near Oceanographer Canyon and Bear Seamount)

**Habitat:** Meso- or bathypelagic in depths of 300–800 m; rarely collected

**Spawning:** Undescribed

**Eggs:** – Undescribed

**Larvae:**

- Size at hatching undescribed, but mouth parts well-developed, protrusible; yolk mostly depleted
- Mouth becomes long and tubular in larger larvae, juveniles and adults
- Anterior dorsal and pelvic fin rays well-formed, elongate at hatching; note fleshy base of anterior dorsal rays
- Preanus length 55–60% SL
- Pelvic fin ray (1) feeble, may be lost in adults; (some descriptions stipulate pelvic fin rays absent)
- Very elongate ascending process of premaxilla
- Swellings along fin rays (present in certain other lampridiforms) not present
- Body very slender throughout development
- Pattern of interdigitation includes a single pterygiophore (and no predorsal elements) in interneural space 1
- Sequence of fin ray formation: D, P<sub>2</sub> – C – P<sub>1</sub>, A
- Fin rays completely developed before 20 mm, except pectoral fin rays complete at larger size
- Caudal fin rays develop late in larval stage (12–20 mm); fin is asymmetrical with lowermost 2 rays elongate
- Pigmentation in early larvae includes dense scattering of melanophores over gut; a belt of pigment on body over rear part of anal fin; pigment accumulation at base of caudal fin rays; pigment spreads to cover most of body in later stages
- Transformation to juvenile stage involves loss of elongate dorsal and pelvic fin rays and loss of 3 lower caudal fin rays; eye becomes telescopic; important characters visible in juveniles include 1<sup>st</sup> 2 dorsal fin pterygiophores greatly enlarged and inclined sharply forward; 1<sup>st</sup> neural spine also inclined forward; 2<sup>nd</sup> neural spine absent

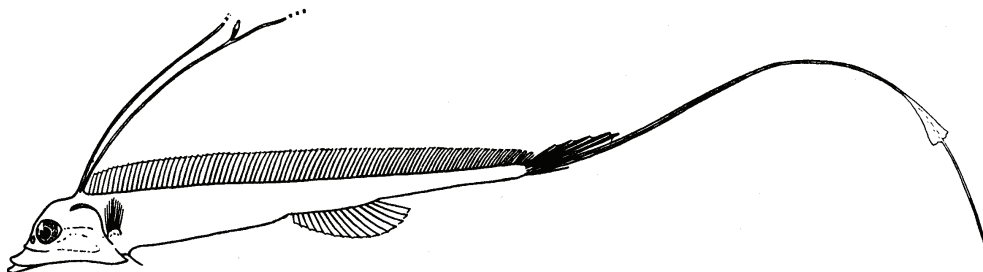
**Meristic Characters**

Myomeres:	about 50–53
Vertebrae:	50–53
Dorsal fin rays:	115–124
Anal fin rays:	14–17
Pectoral fin rays:	10–11
Pelvic fin rays:	1 (larvae)
Caudal fin rays:	5–6+2 elongate

**Note:** 1. Myomere (or vertebral) counts relatively low compared to other lampridiforms

**Juvenile:**

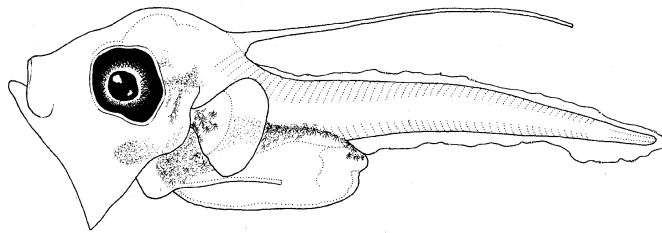
**D. 38.0 mm**



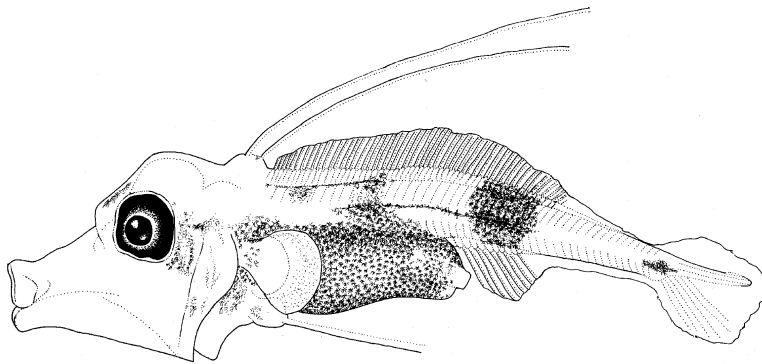
**Figures:** Adult: Johnson and Berman, 1986; A–C: Betsy Washington (Olney, 1984); D: Johnson and Berman, 1986

**References:** Olney, 1984; 2002; Olney *et al.*, 1993

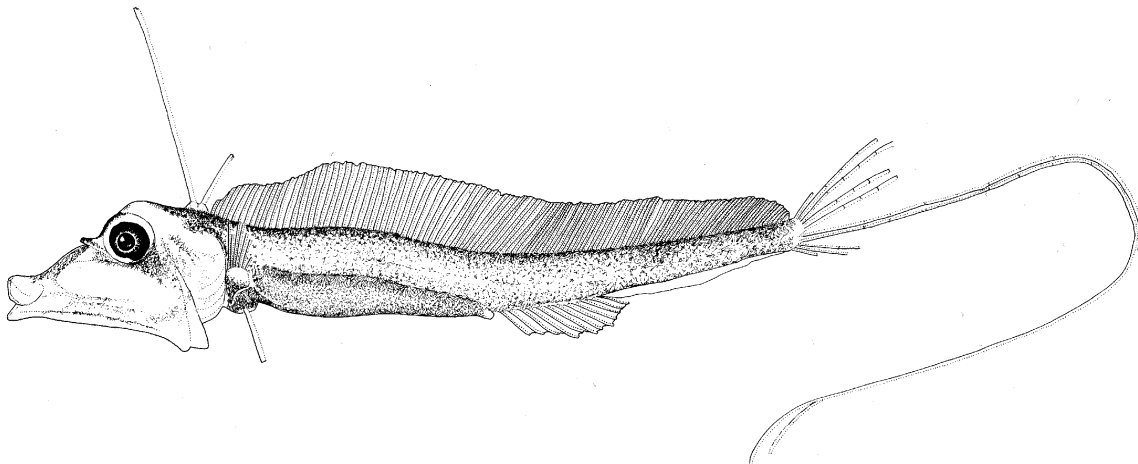
*Stylophorus chordatus*



**A. 3.8 mmSL**



**B. 7.6 mmSL**



**C. 21.4 mmSL**

Lower 3 caudal fin rays  
lost at transformation

***Lophotus lacepede* Giorna, 1809****Lophotidae****Crested oarfish (or crestfish)**

**Range:** Worldwide in warm-temperate to tropical waters; in the western North Atlantic reported from Florida to Brazil

**Habitat:** Epi- and mesopelagic in depths to 92 m; larvae may drift into study area *via* Gulf Stream

**Spawning:** Undescribed

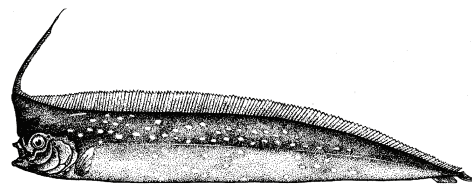
**Eggs:**

- Pelagic, spherical
- Diameter: 2.48–2.64 mm
- Chorion amber, equipped with small spinules
- Oil globules absent

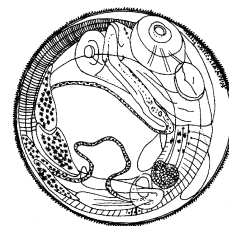
**Larvae:**

- Hatching size undescribed, but mouth parts well-developed, protrusible; yolk mostly depleted
- Anterior dorsal and pelvic fin rays well-formed and elongate, at hatching; note fleshy base of anterior dorsal fin rays
- Preamble length about 50% SL; increases to 80–90% SL in later stages
- Flexion occurs at <25 mm
- Pelvic fin ray number increases from 2 to 5 in adults (although these fin rays are fragile and are often absent)
- Very elongate ascending process of premaxilla
- Pigmented swellings occur along length of dorsal fin rays and at tips of pelvic fin rays
- Fin rays early-forming
- Sequence of fin ray formation: D, P<sub>2</sub> – C – P<sub>1</sub>, A
- Body slender, head moderate
- Pattern of interdigitation includes a single pterygiophore (and no predorsal elements) in interneural space 1
- Dorsal fin rays have laterally projecting spinules
- Caudal fin form is symmetrical; final position of anal fin very near caudal fin
- Pigmentation in early larvae includes melanophore accumulations forming 5–6 bars along body; pigment on top of head, along dorsum of gut
- Transformation not well described; involves lengthening of gut, decrease in size of eye; development of an ink-sac over the gut cavity, capable of emptying through the anus; important characters visible in juveniles include 1<sup>st</sup> 2 dorsal fin pterygiophores greatly enlarged and inclined sharply forward; 1<sup>st</sup> neural spine also inclined forward; 1–2 fang-like teeth present on vomer; supraoccipital process large, projects anteriorly

**Note:** 1. *Lophotus lacepede* Bosc, 1817 (note author) also refers to this species.

**Meristic Characters**

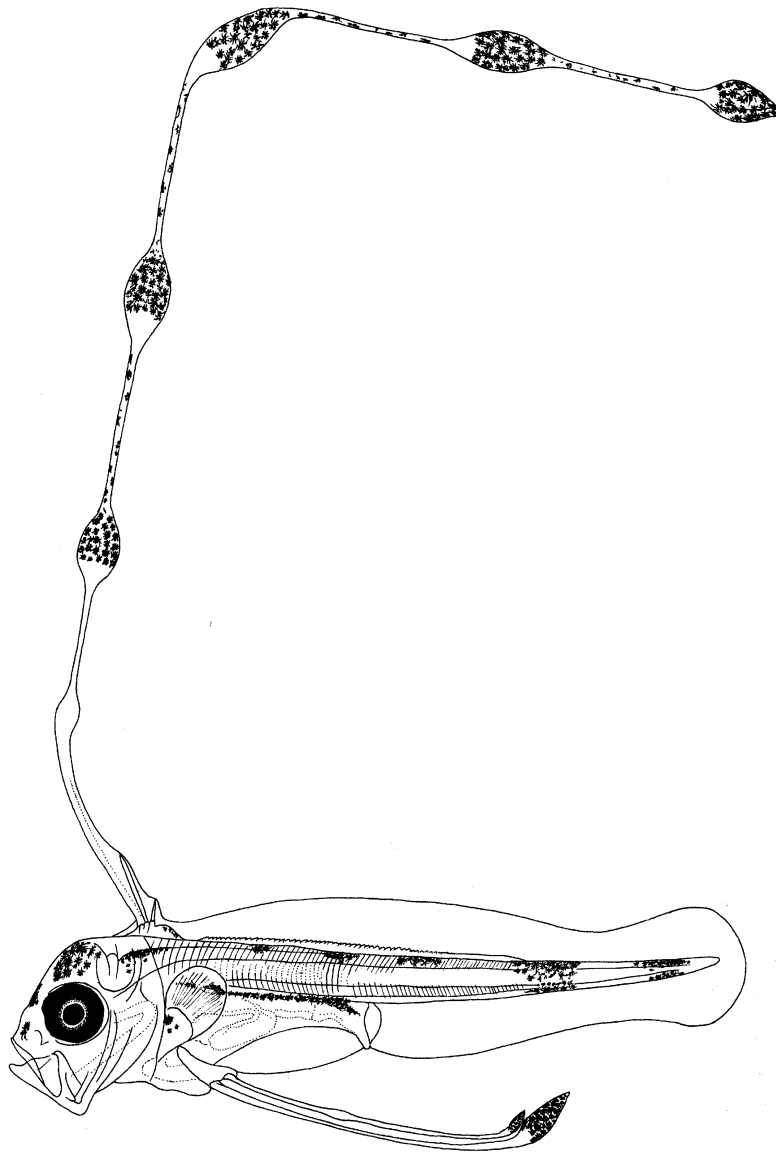
Myomeres:	about 124–153
Vertebrae:	124–153
Dorsal fin rays:	206–263
Anal fin rays:	12–20
Pectoral fin rays:	14–17
Pelvic fin rays:	5
Caudal fin rays:	16–17



**Figures:** Adult: Palmer, 1986; Egg: R. Walker (Charter and Moser, 1996d, redrawn from Sanzo, 1940b); A: Sanzo, 1940b

**References:** Sanzo, 1940b; Olney, 1984; 2002; Olney *et al.*, 1993; Charter and Moser, 1996d;

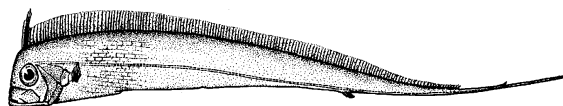
*Lophotus lacepede*



A. 12.1 mmSL

***Radiicephalus elongatus* Osório, 1917****Radiicephalidae**

No common name



**Range:** Worldwide in temperate and tropical waters; very few immature specimens reported from western Atlantic waters; range not well described

**Habitat:** Epi- and mesopelagic (possibly bathypelagic)

**Spawning:** Undescribed

**Eggs:** – Undescribed; ovarian eggs about 2.5 mm in diameter

**Larvae:**

- Hatching size undescribed but mouth parts well-developed, protrusible; yolk mostly depleted
- Anterior dorsal and pelvic fin rays early forming, but not exceedingly elongate
- Dorsal fin rays have laterally projecting spinules
- Preanus length about 60% SL throughout development
- Flexion occurs at about 17 mm
- Very elongate ascending process of premaxilla
- No pigmented swellings along dorsal or pelvic fin rays (as in certain other lampridiforms)
- Body remains moderately slender through development
- Sequence of fin ray development: D, P<sub>2</sub> – C – P<sub>1</sub> – A
- Pattern of interdigitation includes 1 pterygiophore (and no predorsal elements) in interneural space 1; the second interneural space has as many as 13–14 pterygiophores inserted
- As many as 9–10 pelvic fin rays form (well behind level of pectoral fin), become feeble and may be lost in juveniles and adults
- Caudal fin in 2 parts; lower 6–7 rays very elongate
- Pigmentation in early larvae includes distinct groups of melanophores on top of head, anterior to eye, over gut, and spaced along body (6 dorsal patches, 3 ventral patches) with a distinct group near tail tip
- Transformation is gradual and unmarked; an ink-sac develops over and behind anus and is visible through body wall by 17 mm; important characters visible in juveniles include 1<sup>st</sup> 2 dorsal fin pterygiophores greatly enlarged and inclined sharply forward; 1<sup>st</sup> neural spine also inclined forward; 1–2 fang-like teeth present on vomer; supraoccipital process large, projects anteriorly; elongate haemal spines on preural centra 4–6

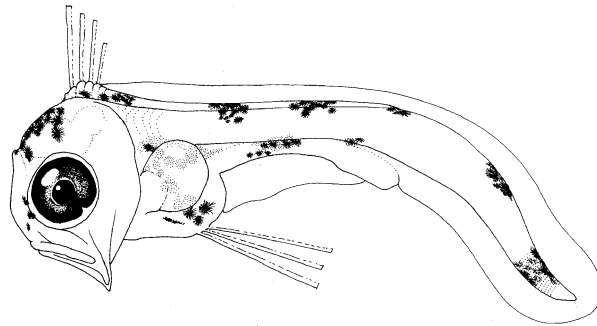
**Meristic Characters**

Myomeres:	about 114–121
Vertebrae:	114–121
Dorsal fin rays:	150–160
Anal fin rays:	6–7 (feeble)
Pectoral fin rays:	9–10
Pelvic fin rays:	9 (may be lost)
Caudal fin rays:	4–5 + 6–7

**Figures:** Adult: Palmer, 1986; **A, C:** Robert Walker (Charter and Moser, 1996d); **B:** Betsy Washington (Olney, 1984)

**References:** Harrison and Palmer, 1968; Olney, 1984; 2002; Olney *et al.*, 1993; Charter and Moser, 1996d

*Radiicephalus elongatus*



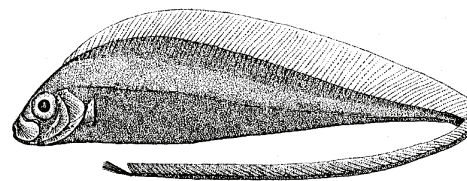
**A. 7.2 mmSL**



**B. 18.4 mmSL**



**C. 20.3 mmSL**

***Desmodema polystictum* (Ogilby, 1898)****Trachipteridae****Polka-dot ribbonfish**

**Range:** Worldwide in temperate to tropical waters; in the western North Atlantic from North Carolina to Florida, Gulf of Mexico and Cuba; a few records as far north as Wilmington and Veatch canyons

**Habitat:** Mesopelagic; young are epipelagic

**Spawning:** Undescribed

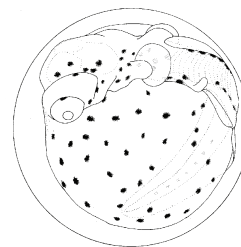
**Eggs:** – Undescribed; eggs of a Pacific congener (*Desmodema lorum*) are 2.4–2.5 mm, lack oil globules, have amber to pink chorion equipped with pits, and have large melanophores scattered over the yolk

**Larvae:** – Early larvae undescribed; description based on *D. lorum* from eastern Pacific

- Body very compressed anteriorly, constricted posteriorly to form slender tail
- Head large, anterior profile steep, mouth oblique
- Very elongate ascending process of premaxilla
- Gut cavity thick, extends well posteriorly (to about 80% of SL)
- Anterior dorsal and pelvic fin rays form early, before hatching; dorsal fin origin over eye; pelvic fin rays elongate
- Sequence of fin ray formation: D, P<sub>2</sub> – C – P<sub>1</sub>
- Pectoral fin rays form last
- 7 dorsal fin pterygiophores insert into first interneural space (a different pattern is found in other lampridiform taxa in study area)
- Caudal fin very small, form is symmetrical; anal fin absent but persistent postanal finfold present until early juvenile stage
- Dorsal fin rays have laterally projecting spinules
- Caudal and pelvic fin rays have laterally projecting spinules
- Lateral line scales bear spines
- Pigmentation includes scattered melanophores over head and body, more concentrated on dorsal part of peritoneum, top of head, anterior to eye and dorsum of body (over the pterygiophores)
- Transformation is direct and gradual; dorsal fin rays continue to form posteriorly, into juvenile stage; pelvic fin rays lost; important characters visible in juveniles include presence of 1–2 fang-like teeth on vomer, and absence of pleural ribs

**Meristic Characters**

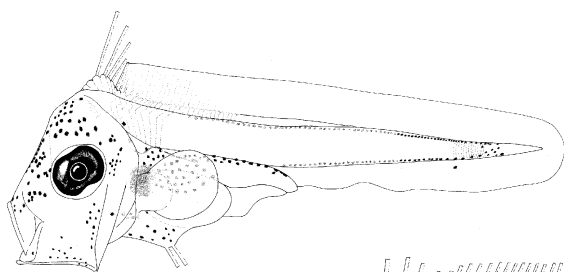
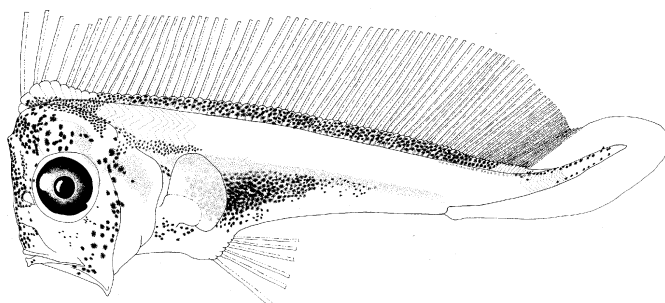
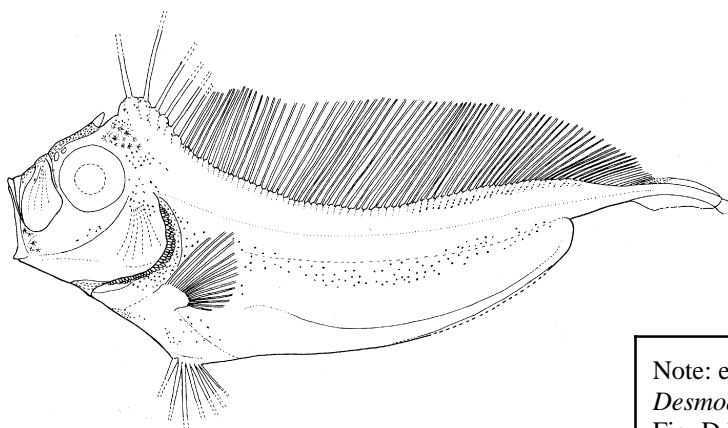
Myomeres:	about 71–74
Vertebrae:	71–74
Dorsal fin rays:	120–124
Anal fin rays:	none
Pectoral fin rays:	12–14
Pelvic fin rays:	none
Caudal fin rays:	7–10



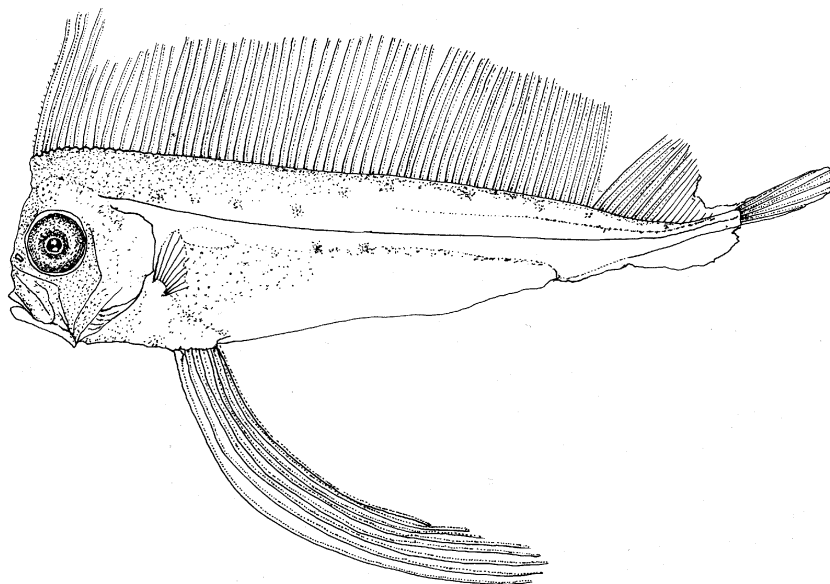
**Note:** 1. Absence of anal and pelvic fin rays in juveniles and adults distinguishes this species from other lampridiforms

**Figures:** Adult: Rosenblatt and Butler, 1977 (redrawn in Heemstra and Kannemeyer, 1986); Egg and **A, B**: Robert Walker (Charter and Moser, 1996d); **C**: Amaoka *et al.*, 1992; **D**: Okiyama, 1988

**References:** Olney, 1984; 2002; Amaoka *et al.*, 1992; Olney *et al.*, 1993; Charter and Moser, 1996d

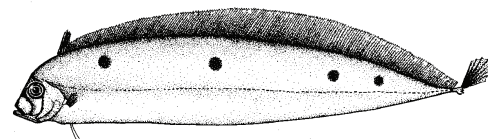
*Desmodema polystictum***A. 6.0 mmSL****B. 11.3 mmSL****C. 24.8 mmSL**

Note: egg and Figs. A-C based on *Desmodema lorum*, a Pacific species;  
Fig. D based on *D. polystictum* from  
western Pacific Ocean

**D. 27.5 mmSL**

***Trachipterus arcticus* (Brünnich, 1788)****Trachipteridae**

Deal fish



**Range:** Worldwide in all oceans, usually in warm temperate waters; in the western North Atlantic from New York to Florida and Gulf of Mexico

**Habitat:** Mesopelagic in depths to 600 m; young stages are epipelagic

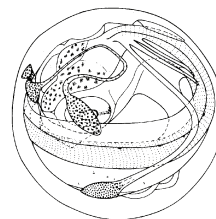
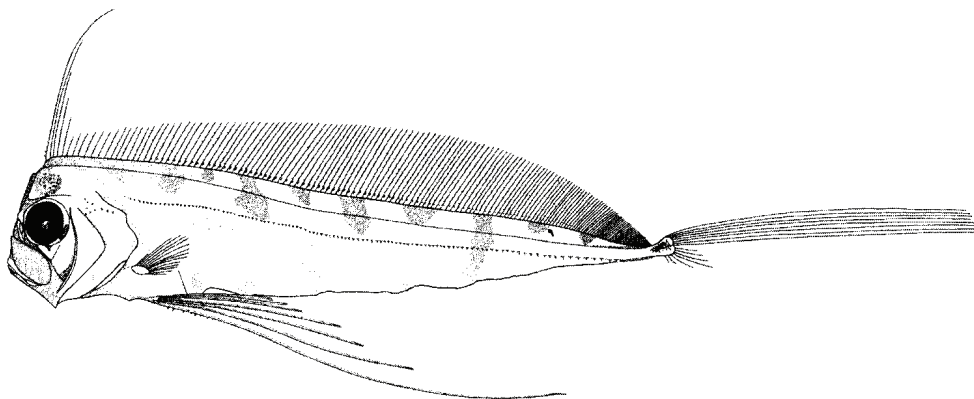
**Spawning:** Undescribed

**Eggs:** – Undescribed; eggs of *Trachipterus altivelis* (eastern Pacific) are 2.8–3.1 mm in diameter, have a homogeneous, unpigmented yolk, and an amber chorion with fine striations; oil globules are absent

**Larvae:** – Hatching size about 7.2 mm  
 – Anterior dorsal and pelvic fin rays formed at hatching, very elongate, and remain elongate through larval stage  
 – Body elongate, with large, flexed head  
 – Very elongate ascending process of premaxilla  
 – Gut moderately thick; preanus length increases from about 50% of SL to about 64% SL  
 – Paddle-shaped swellings along pelvic fin rays and at tip of 1<sup>st</sup> dorsal fin ray are densely pigmented  
 – Sequence of fin ray formation: D, P<sub>2</sub> – C – P<sub>1</sub>  
 – 1 dorsal fin pterygiophore (and no predorsal elements) insert into first interneural space (a different pattern is found in other lampridiform taxa in study area)  
 – Anal fin absent, but persistent, postanal finfold present  
 – Dorsal fin rays have laterally projecting spinules  
 – Caudal and pelvic fin rays have laterally projecting spinules  
 – Caudal fin forms in 2 lobes; upper lobe usually upturned, lower lobe with 5–6 fin rays  
 – Lateral line scales bear spines  
 – Pigmentation includes dense covering of melanophores scattered on head and opercle; surface of gut well-pigmented; line of spots forms over dorsal fin pterygiophores  
 – Transformation is direct and gradual; pelvic fin rays are reduced in size; important characters visible in juveniles include presence of 1–2 fang-like teeth on vomer, and absence of pleural ribs

**Meristic Characters**

Myomeres:	about 99–102
Vertebrae:	99–102
Dorsal fin rays:	150–190
Anal fin rays:	none
Pectoral fin rays:	9–11
Pelvic fin rays:	5–7
Caudal fin rays:	8 + 5–6

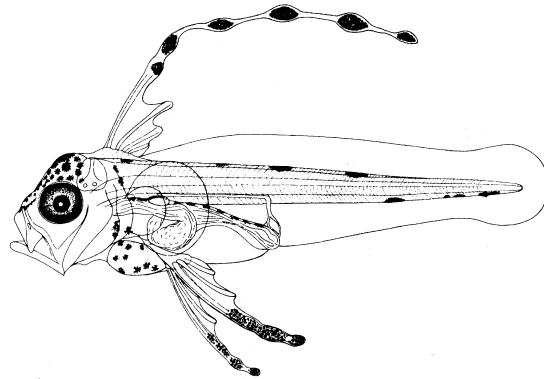
**Early Juvenile:****E. 49.4 mmSL**

**Figures:** Adult: Palmer, 1986; Egg: Matarese and Sandknop, 1984; **A:** Mito, 1961b; **B:** Robert Walker (Charter and Moser, 1996d); **C, D:** Bev Vinter (Matarese *et al.*, 1989); **E:** Jack Javech (Olney and Richards, 2006)

**References:** Olney, 1984; 2002; Palmer, 1986; Olney *et al.*, 1993; Charter and Moser, 1996d

*Trachipterus* sp.

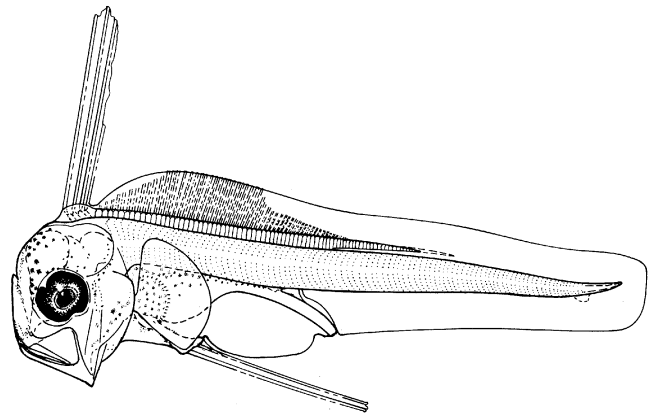
**A. 7.2 mmSL**  
**(*Trachipterus* sp.)**



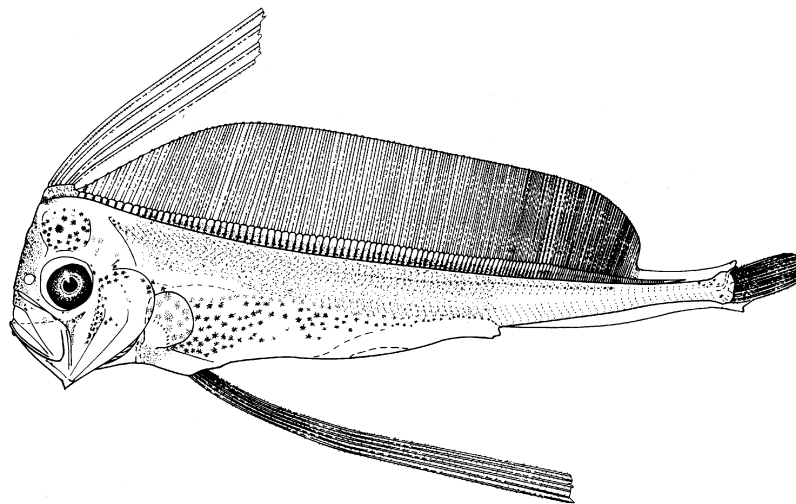
Note: Figs. B-D based on  
*Trachipterus altivelis*, an  
eastern Pacific species



**B. 7.4 mmSL** (*Trachipterus altivelis*)



**C. 9.4 mmSL** (*Trachipterus altivelis*)



**D. 24.0 mmSL** (*Trachipterus altivelis*)

***Zu cristatus* (Bonelli, 1819)****Trachipteridae****Scalloped ribbonfish**

**Range:** Worldwide in warm temperate and tropical waters; in the western North Atlantic known from Gulf of Mexico, Cuba, Florida and several isolated occurrences (including young stages) near Norfolk Canyon, La Have Basin, and Bear Seamount

**Habitat:** Epi- to mesopelagic in depths to 90 m

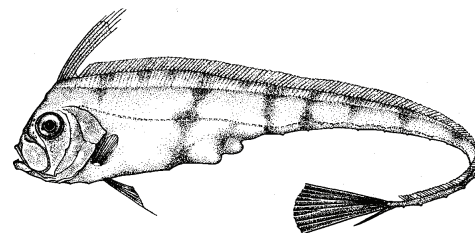
**Spawning:** Undescribed

**Eggs:**

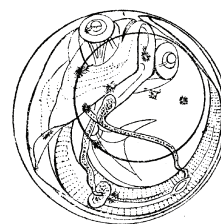
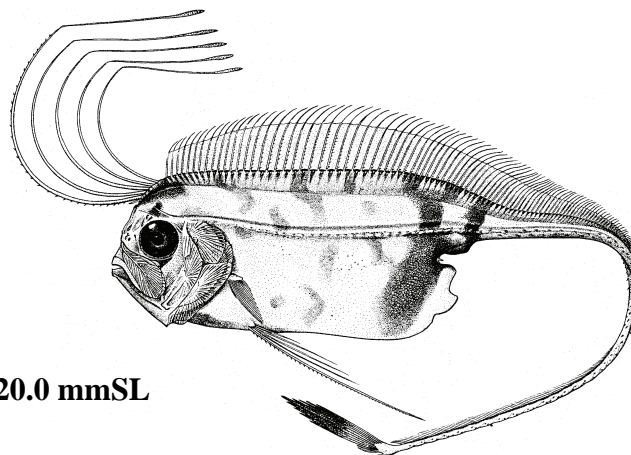
- Pelagic, spherical; diameter: 1.9–2.1 mm
- Chorion amber to dark pink, pitted with small, uneven striations
- Yolk homogeneous, oil globules absent

**Larvae:**

- Hatching occurs at size <3.7 mmSL; anterior dorsal and pelvic fin rays well developed, elongate, and remain elongate through larval stage
- Body elongate, with large, moderately flexed head
- Very elongate ascending process of premaxilla
- Sequence of fin ray formation: D, P<sub>2</sub> – C – P<sub>1</sub>
- Preanus length increases from about 50% SL to 60% SL, then decreases to <50% SL in juveniles
- Paddle-shaped swellings along pelvic fin rays and at tip of 1<sup>st</sup> dorsal fin ray are densely pigmented
- 1 dorsal fin pterygiophore (and no predorsal elements) insert into first interneural space
- Anal fin absent, but persistent, postanal finfold present
- Dorsal fin rays have laterally projecting spinules
- Caudal and pelvic fin rays have laterally projecting spinules
- Caudal fin forms in 2 lobes; upper lobe usually upturned, lower lobe with 1–5 fin rays
- Lateral line scales bear spines
- Pigmentation includes clusters of melanophores forming barred pattern on body
- Transformation is direct and gradual; pelvic fin rays are reduced in size; important characters visible in juveniles include presence of 1–2 fang-like teeth on vomer, and absence of pleural ribs

**Meristic Characters**

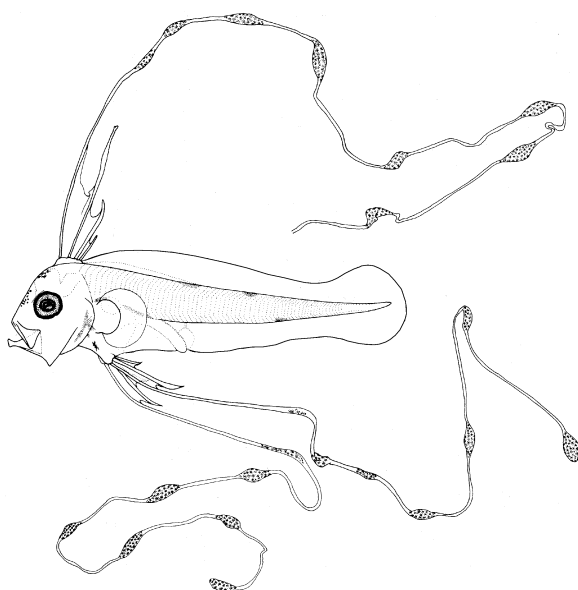
Myomeres:	about 62–69
Vertebrae:	62–69
Dorsal fin rays:	120–150
Anal fin rays:	none
Pectoral fin rays:	10–12
Pelvic fin rays:	3–7
Caudal fin rays:	8–12 + 1–5

**Juvenile:****E. 120.0 mmSL**

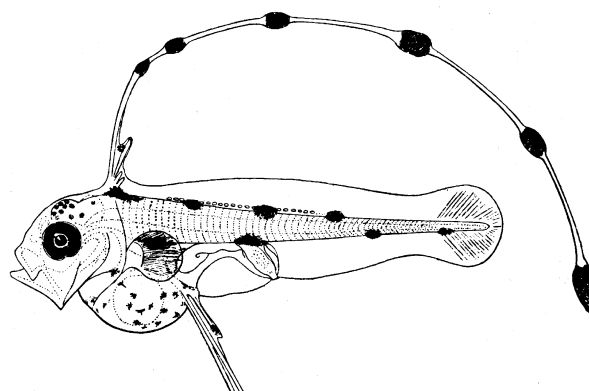
**Figures:** Adult: Palmer, 1986; Egg and B: Sparta, 1933; A: Mary Vona (Charter and Moser, 1996d); C: Robert Walker (Charter and Moser, 1996d); D: Heemstra and Kannemeyer, 1986; E: N. Strekalovsky (Backus *et al.*, 1965)

**References:** Olney, 1984; 2002; Palmer, 1986; Olney *et al.*, 1993; Charter and Moser, 1996d

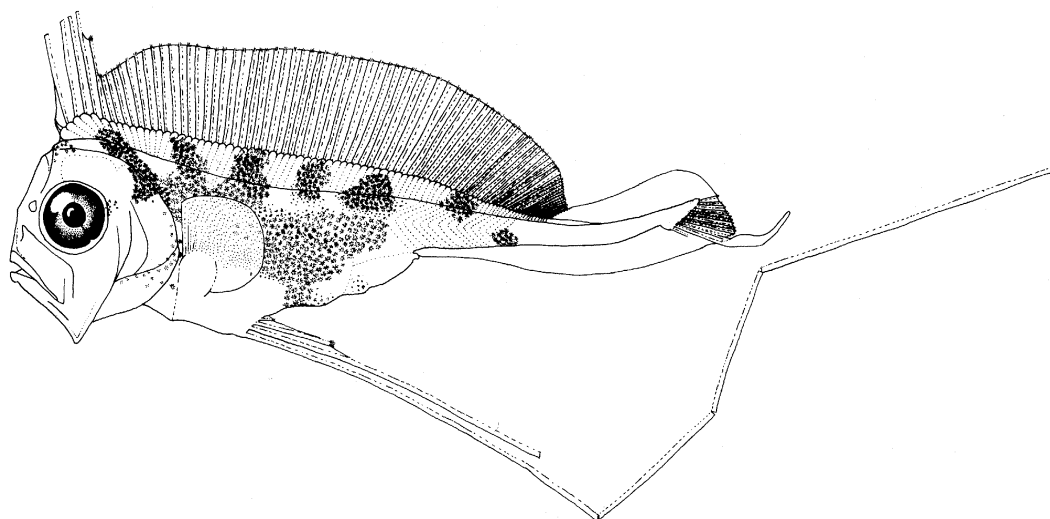
*Zu cristatus*



**A. 5.8 mmSL**

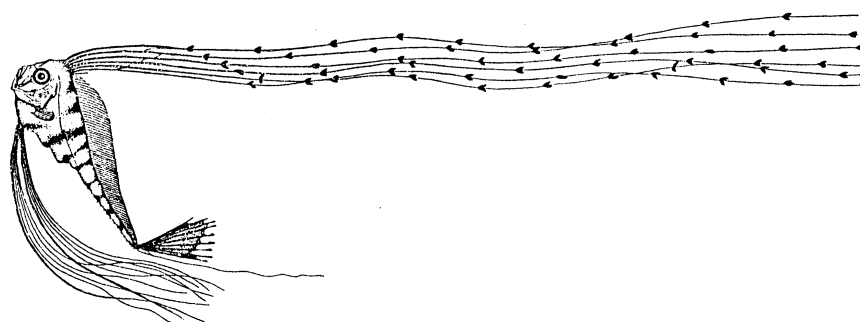


**B. 6.5 mmSL**



**C. 13.7 mmSL**

**D. 100.0 mm  
(Swimming  
Posture of  
Juvenile)**



***Regalecus glesne* Ascanius, 1772****Regalecidae****Oarfish**

**Range:** Worldwide in warm-temperate to tropical waters; in the western North Atlantic from North Carolina to Bermuda and Gulf of Mexico with scattered records as far north as Georges Bank and Bear Sea-mount

**Habitat:** Mesopelagic in depths to 1,000 m

**Spawning:** Undescribed

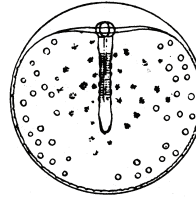
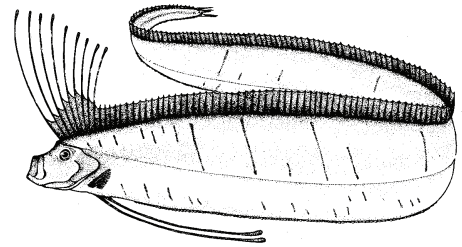
**Eggs:**

- Pelagic, spherical
- Diameter: 2.4–2.5
- Chorion: thick, pitted (as in *Zu cristatus*)
- Oil globules numerous on yolk surface

**Larvae:**

- Hatching occurs at about 5.0 mm; anterior dorsal and pelvic fin rays well developed, elongate, and remain elongate through larval stage
- Body moderately elongate, with large, moderately flexed head
- Very elongate ascending process of premaxilla
- Sequence of fin ray formation: D, P<sub>2</sub> – C – P<sub>1</sub>
- Preamble length decreases from about 60% SL at hatching, to about 50% in juveniles
- Paddle-shaped swellings along anterior dorsal fin rays and at tip of pelvic fin rays are densely pigmented
- 1 dorsal fin pterygiophore (and no predorsal elements) insert into first interneural space
- Anal fin absent
- Dorsal fin rays have laterally projecting spinules
- Caudal and pelvic fin rays have laterally projecting spinules
- Caudal fin reduced to 3–4 fin rays
- Number of pelvic fin rays are reduced to 1 stout, elongate ray, and 1 small splint
- Pigmentation includes clusters of melanophores along body and several clusters along dorsum of gut; top of head densely pigmented; series of melanophores in thoracic region
- Transformation is direct and gradual; important characters visible in juveniles include presence of 1 or 2 fang-like teeth on vomer and reduction of pelvic fins

**Note:** 1. High number of myomeres/vertebrae

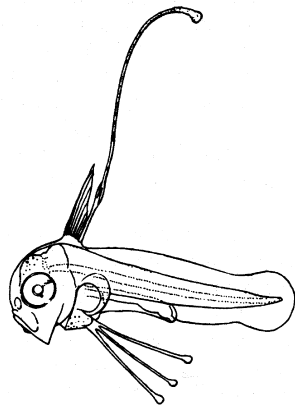
**Meristic Characters**

Myomeres:	about 143–151
Vertebrae:	143–151
Dorsal fin rays:	260–412
Anal fin rays:	none
Pectoral fin rays:	12–13
Pelvic fin rays:	1 + 1
Caudal fin rays:	3–4

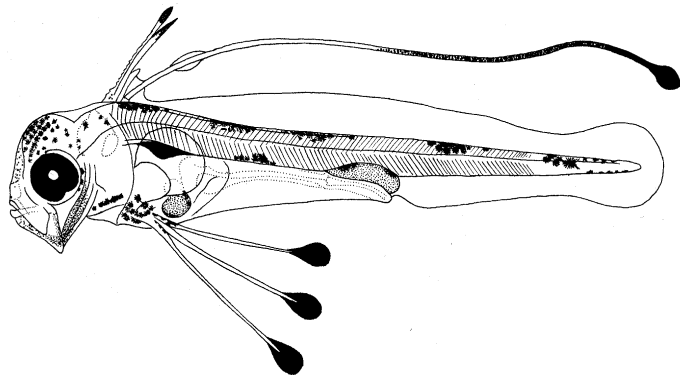
**Figures:** Adult: Palmer, 1986; Egg and A: Sanzo, 1925 (A reversed); B–C: Sparta, 1933 (both reversed)

**References:** Sanzo, 1925; Olney, 1984, 2002; Olney *et al.*, 1993

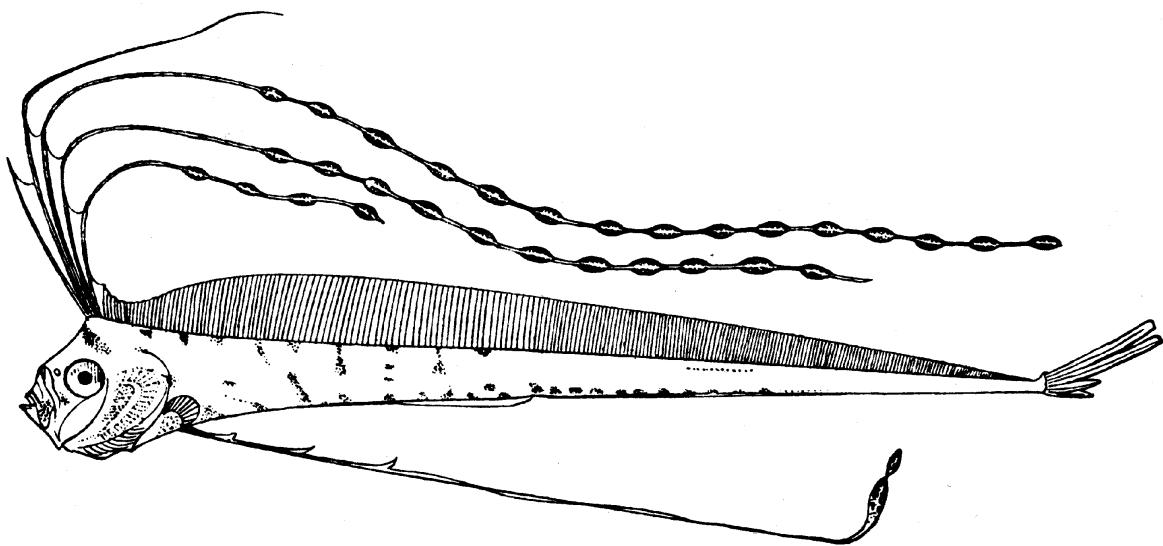
*Regalecus glesne*



A. ~5.0 mmSL  
(Recently hatched, size undescribed)



B. 5.4 mmSL



C. 45.8 mmSL