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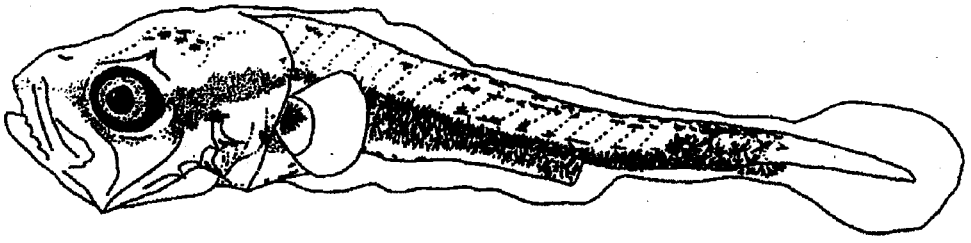
PRELIMINARY GUIDE TO THE IDENTIFICATION OF THE EARLY LIFE HISTORY STAGES OF RACHYCENTRID FISHES OF THE WESTERN CENTRAL ATLANTIC

BY

JAMES G. DITTY



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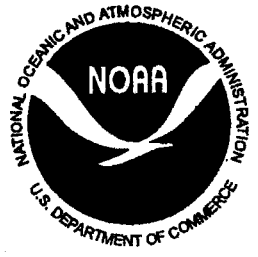

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RACHYCENTRIDAE: Cobias

by J. G. Ditty

The family Rachycentridae, contains a single cosmopolitan species, *Rachycentron canadum*, found primarily in tropical and subtropical waters, except those of the eastern Pacific (Briggs 1960). Cobia are a highly prized recreational species that are also taken incidentally in commercial fisheries (Shaffer and Nakamura 1989). In the western Atlantic, cobia occur from Massachusetts to Argentina but are most common along the U. S. Atlantic and Gulf coasts. Cobia are usually absent from northern Gulf of Mexico and temperate Atlantic waters along the U. S. coast during late fall and winter when they are found off the Florida Keys. Cobia migrate north along the Atlantic and Gulf coasts during spring (Hassler and Rainville 1975; Shaffer and Nakamura 1989) reappearing in the northern Gulf during March and April (Springer and Pirson 1958). Cobia are taken off Louisiana and Texas (Shaffer and Nakamura 1989) associated with oil and gas platforms or rafts of *Sargassum*.

Cobia spawn in estuarine and shelf waters during the day. Eggs are spherical, average 1.24-mm in diameter, have a single oil globule (mean diameter 0.45-mm), and are usually collected in the upper meter of the water column.. The embryo is heavily pigmented and the perivitelline space narrow.

Larvae hatch at about 2.5-mm SL and have 25 myomeres that are difficult to count due to heavy body pigmentation. The gut extends about two-thirds body length and is initially straight but forms a single, loose coil prior to notochord flexion. This results in a distinct bulge along the ventral midline of the visceral mass until early postflexion. Larvae are characterized by a: low myomere count; ridge above the eye with a single supraorbital spine; placement of preopercular spines; heavier ventrolateral than dorsolateral body pigmentation; and minute epithelial spicules covering the body integument. Spines of the first dorsal fin are short and difficult to see.

Similarities in larval morphology provide evidence of a sister-group relationship between cobia and dolphinfish (Family Coryphaenidae) rather than that previously hypothesized between cobia and remoras (Family Echeneididae) (Johnson 1984). Larval cobia resemble coryphaenids, echeneidids, belonids, and hemirhamphids. Larval coryphaenids have a similar head spination pattern and body shape as cobia but have more vertebrae and dorsal fin rays (30-34 vertebrae and >50 fin rays in coryphaenids versus 25 and 28-35, respectively, in cobia). Dolphinfish also lack spines in the dorsal and anal fins. Larval echeneidids lack head spination and have recurved dentary teeth. Belonids and hemirhamphids have >50 myomeres, pelvic fins located near mid-body, little if any head spination, and an elongate lower jaw.

RACHYCENTRIDAE

Rachycentron canadum (Linnaeus, 1766)

MERISTICS

Vertebrae	
Precaudal	11
Caudal	14
Total	25
Number of fin spines and rays	
First Dorsal	VII-VIII+I
Second Dorsal	29-32 (26-34)
Total Dorsal Elements	37-41
Anal	I-II, 23-26 (22-28)
Total Anal Elements	23-30
Pectoral	20-21
Pelvic	I, 5
Caudal	
Dorsal Secondary	15-16
Principal	9+8
Ventral Secondary	12-14
Total	44-47
Gillrakers on first arch	
Upper	
Lower	7-9
Total	
Branchiostegals	7

LIFE HISTORY

Range: throughout area
Habitat: epipelagic, shelf
ELH pattern: oviparous, buoyant eggs, pelagic larvae
Spawning
- Season: May-August
- Area: estuarine passes and shelf during the day
- Mode: serial spawner
- Migration: north-south/spring-fall

Fecundity:
Age at first maturity: males age 2, all females by age 3
Longevity: 15+ years

Literature: Meek & Hildebrand 1925; Dawson 1971; Johnson 1984; Shaffer & Nakamura 1989; Ditty & Shaw 1992

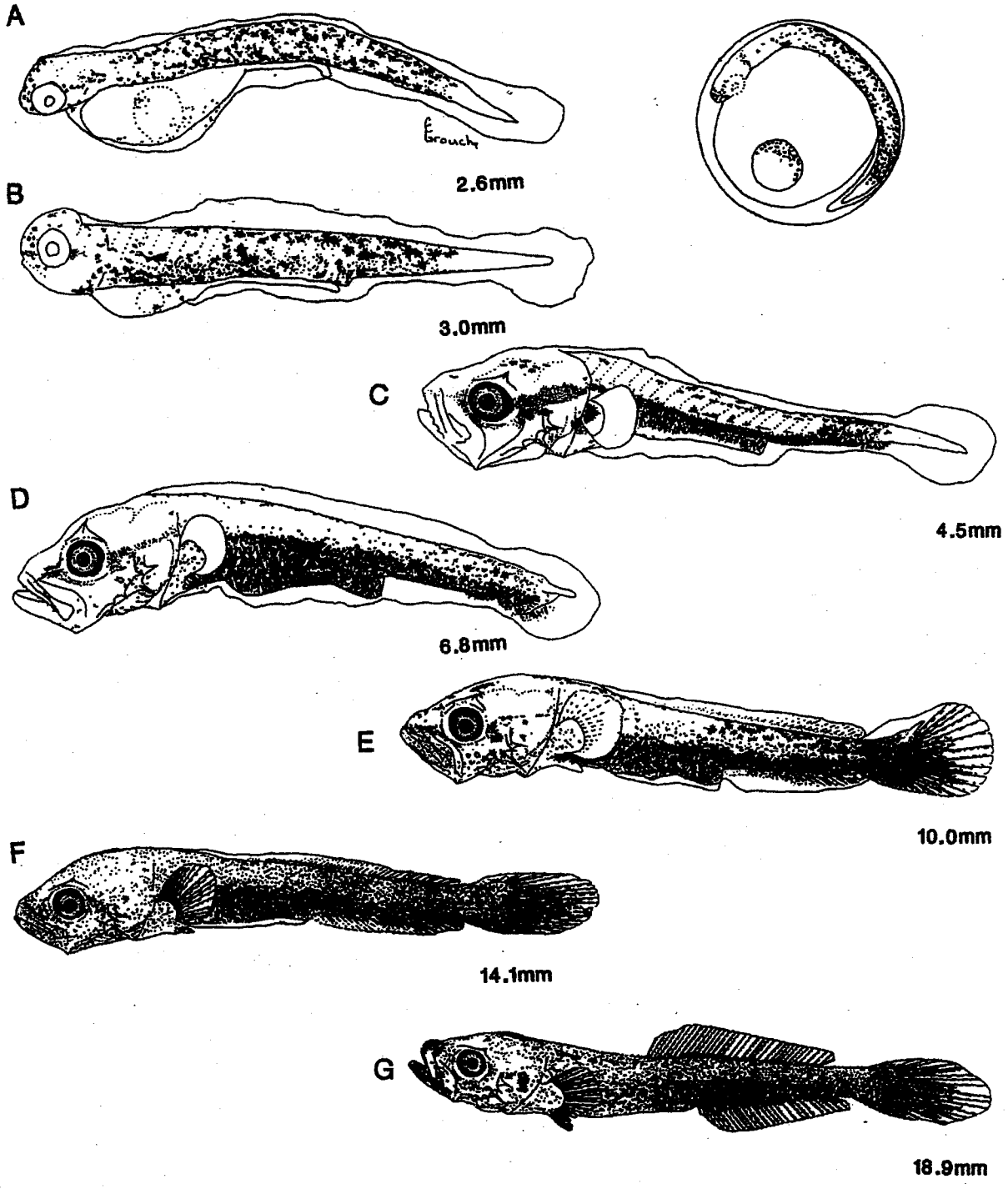
EARLY LIFE HISTORY DESCRIPTION

EGGS:
Diameter: 1.15-1.42-mm, Mean: 1.24-mm
No. of Oil Globules: one
Oil Globule Diameter: 0.34-0.65-mm, Mean: 0.45-mm
Yolk: segmented,
Shell: smooth
Hatch Size: 2.5-mm SL
Incubation: 24 hrs at 29°C
Pigment: oil globule and embryo
Diagnostic Characters: narrow perivitelline space; embryo heavily pigmented except caudal peduncle

LARVAE:
Length at flexion: 6.5-8.0-mm SL
Length at transformation: 20.0-mm SL
Sequence of fin development: anal-second dorsal-pelvic-pectoral-first dorsal
Pigment: heavy
Diagnostic: large ridge above eye with single supraorbital spine; heavy body pigmentation; low myomere count; placement and number of preopercular spines; from *Coryphaena* by number of second dorsal rays and myomeres

Illustrations: Egg, A- 2.6 mm NL, B – 3.0 mm NL, C – 4.5 mm NL and F – 14.0 mm SL, G – 18.9 mm SL all from Ditty and Shaw, 1992; D – 6.8 mm SL, original; E – 10.0 mm SL, from Johnson, 1984

Rachycentron canadum RACHYCENTRIDAE



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