NOAA Technical Memorandum NMFS-SEFSC-448

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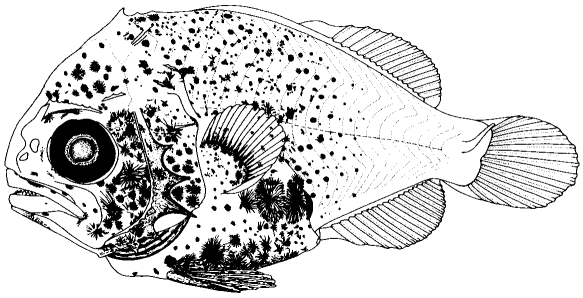

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It will be a chapter entitled Ephippidae in the forthcoming book "Guide to the early life history stages of fishes of the western central Atlantic" to appear in the future.

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Family Ephippidae: spadefish

by

J. G. Ditty

The percoid family Ephippidae is usually considered to comprise 5 genera and 17 species (Nelson 1994). The Atlantic spadefish (*Chaetodipterus faber*) is the only member of this family in the westem North Atlantic Ocean. Rare north of Chesapeake Bay, Atlantic spadefish inhabit coastal waters which extend southward to Brazil (Johnson 1978). Historically, Atlantic spadefish represented a relatively minor portion of recreational fisheries. Nevertheless, fishing tournaments are currently being used to stimulate interest in their fisheries (Schmied & Burgess 1987). Ryder (1887) described eggs and yolk-sac larvae of Atlantic spadefish, but Johnson (1978) questioned the identity of these specimens. Larvae >2.5 mm standard length (SL) are described and illustrated by Hildebrand & Cable (1938), but this study is insufficient to examine important developmental details and is based on the static rather than the dynamic approach to larval description (Berry & Richards 1973). Finucane et al (1979) illustrated 5.1 & 6.4 mm SL Atlantic spadefish. Johnson (1984) commented on cranial morphology and provided insight on the value of larval characters in resolving the relations among ephippids and their relation to other families. Aspects of juvenile and adult life history are discussed for Atlantic spadefish from South Carolina waters by Hayse (1990). A thorough description of the development and seasonal distribution and abundance is described by Ditty et al (1994) on which this account is based.

Chaetodipterus faber larvae are characterized by a single, median patch of pigment on the roof of the mouth prior to the appearance of a median crest. The larvae have a large head with pigment spots scattered over it and a row of melanophores along the ventral midline of the tail. Head spination develops swiftly with a series of preopercular spines along the posterior margin of the outer shelf and another along the inner shelf with both shelves having dorsal & ventral limbs. Three preopercular spines are present along the outer shelf at 1.8 mm with the largest at the angle. Two spines dorsal & ventral to the angle are added by 3.5 mm. A 6th anterior-most spine appeared at 5.0 mm but was resorbed by 11.0 mm in some specimens and an occasional 7th spine was found. The inner shelf had 2-3 spines by 3.5 mm which increased with growth to form a serrate margin. A spine is present on the interopercle by 6.0 mm. Many additional spines and ridges are found on the head as follows: thickened ridge on the supraoccipital at 2.0 mm that develops as median supraoccipital crest with dorsally directed spine at 2.5 mm, regressing at 5.0 mm & resorbed by 10.0-10.5 mm; supraorbital ridge present at 3.5 mm becoming serrate by 4.0 mm; small serrate ridges on dorsal margin of lacrimal, jugal, & 3rd suborbital bones; spines or spinous ridges along 4th & 5th suborbitals, dermosphenotic, posttemporal, pterotic, tabular, & supracleithrum by 6.0 mm; ventral margin of jugal bone near posterior margin of maxillary has a ventrally directed spine by 7.0 mm; & individual spines scattered over frontal and occipital bones. Specialized spinous scales ('pre-scales") begin to develop by 5.5 mm & characterized by a single, elevated, posteriorly directed spine near the scale center. Pre-scales develop on the head then anteriorly along lateral midline, covering body by 10.0 mm, then transforming to ctenoid scales by 18.0 mm. The heavy pigmentation with pigment increasing posteriorly from the head to body and fins is a key character. Meristic characters are given in the species account.

Chaetodipterus faber larvae could be confused with priacanthids, lobotids, some carangids, stromateoids, *Polyprion americanus*, & *Menticirrhus* spp. because of similarities of head spination or in body pigmentation. Priacanthids have an elongate, serrate, median supraoccipital crest that extends posteriorly over the mid- and hindbrain; serrations along the lower jaw and frontal bone; & the angle preopercular spine is elongate and serrate as is the pelvic fin. *Lobotes surinamensis* has a vaulted, serrate supraoccipital crest in early larvae, pelvics are inserted behind the pectoral fin, & have fewer anal fin elemnets (III, 17-18 vs, III, 11-12). Those carangids with a suproccipital crest have it low with serrations along the dorsal edge and have anteriormost 2 anal spines in advance of the anal fin. Some stromateoids resemble spadefish in pigmentation & precocious pelvic fins but have > 30 myomeres and lack a supraoccipital crest and preopercular spines. *Polyprion americanus* larvae have a small, peak-like median supraoccipital crest, but with strong serrations along the leading edge, & lack a serrate pterotic ridge and spines on the tabular bone. *Menticirrhus* larvae lack both the preopercular spine and median supraoccipital crest.

EPHIPPIDAE

Chaetodipterus faber (Broussonet, 1782)

MERISTICS

Vertebrae	
Precaudal	10
Caudal	14
Total	24
Number of fin spines and rays	
First Dorsal	VII-VIII+I
Second Dorsal	21-23
Total Dorsal Elements	29-32
Anal	III, 17-18
Total Anal Elements	20-21
Pectoral	17
Pelvic	I, 5
Caudal	
Dorsal Secondary	4-5
Principal	9+8
Ventral Secondary	4-5
Total	25-27
Gillrakers on first arch	
Total	10-12
Branchiostegals	6

LIFE HISTORY

Range: throughout area
Habitat: pelagic, inner shelf around natural and artificial reefs
ELH pattern: oviparous, pelagic eggs and larvae
Spawning:
Season: May-September along North America
Area: inner shelf
Mode: serial spawner
Migration: nearshore-offshore
Fecundity:
Age at first maturity: age 1
Longevity: 8-10 yrs

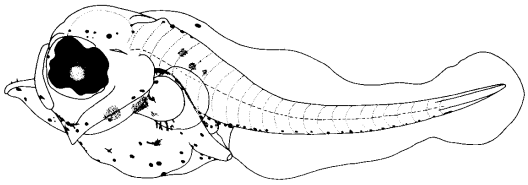
Literature: Hayse, 1990; Ditty, Shaw & Cope 1999

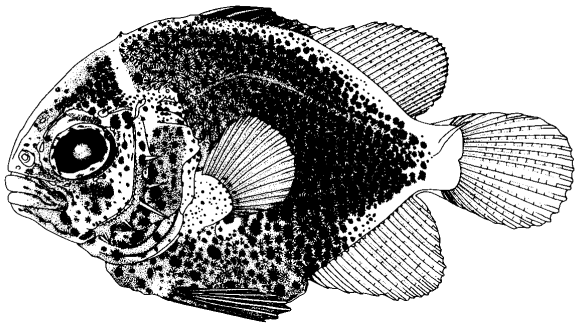
EARLY LIFE HISTORY DESCRIPTION

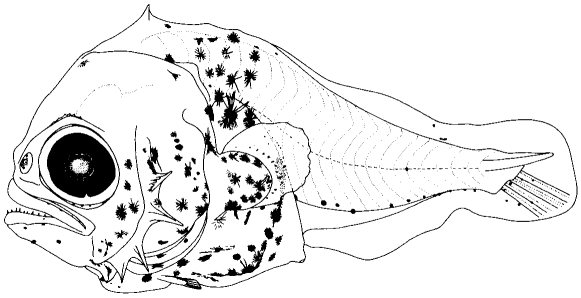
EGGS: little known
Hatch Size: <2.0 mm

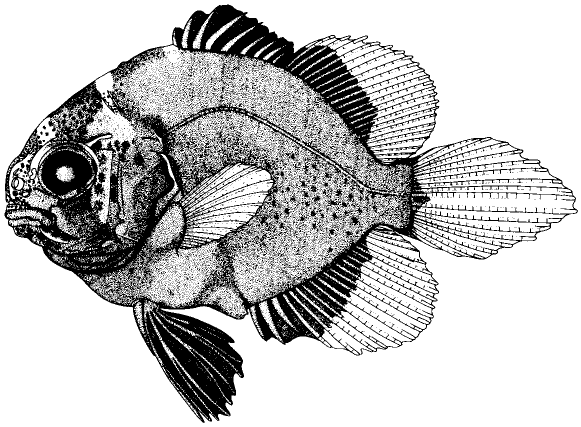
LARVAE:
Length at flexion: 3.5-4.5 mm SL
Length at transformation: 8.0-8.5 mm
Sequence of fin development: C, P_2, D_2, A, D_1, P_1
Pigment: heavy
Diagnostic: median supraoccipital crest with single, dorsally directed spine; large preopercular spines and numerous serrate ridges on head; deep, robust body; median patch of pigment on palatines; early development of specialized "prescales"; teeth in an inner and outer band

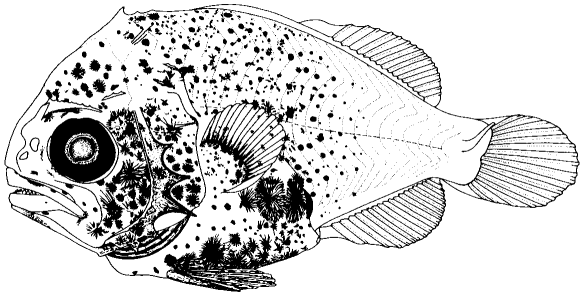
Illustrations: Ditty and Shaw, 1994
Left column top to bottom: 1.8 mm SL, 3.5 mm SL, 5.0 mm SL.
Right column top to bottom: 7.0 mm SL, 11.6 mm SL, head spination of 7.0 mm larva

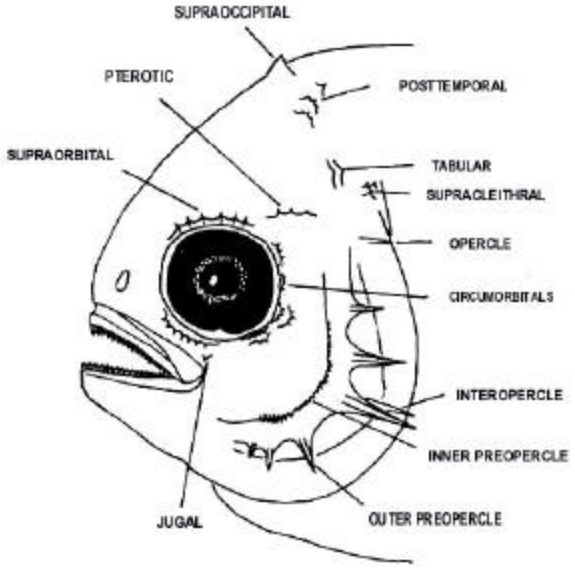











SUPRAOCCIPITAL
PTEROTIC
POSTTEMPORAL
SUPRAORBITAL
TABULAR
SUPRACLEITHRAL
OPERCLE
CIRCUMORBITALS
INTEROPERCLE
INNER PREOPERCLE
JUGAL
OUTER PREOPERCLE

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