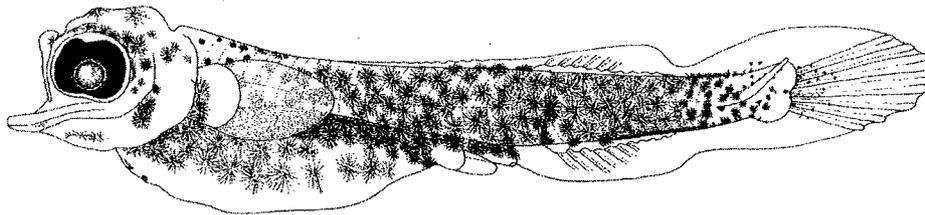




PRELIMINARY GUIDE TO THE IDENTIFICATION OF THE EARLY LIFE  
HISTORY STAGES OF SCOMBERESOCID FISHES OF THE WESTERN CENTRAL  
NORTH ATLANTIC

BY

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It will be chapters entitled Scomberesocidae in the "Guide to the early life history stages of fishes of the western central North Atlantic".

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The Scomberesocidae is defined by one derived character: the dorsal and anal fins are followed by a series of 4-7 finlets. This family is the sister group of the Belonidae forming the superfamily Scomberesocoidea sharing two derived characters: presence of a premaxillary canal and upper jaw at least slightly elongate (Collette et al. 1984). Other diagnostic characters include: third pair of upper pharyngeal bones separate, fourth upper pharyngeal bone usually present, and scales on the body are relatively small.

There are no spines in the fins. The dorsal, with 14-18 rays, and anal fins, with 16-21 rays, are posterior in position; the pelvic fins, with 6 soft rays, are located in an abdominal position; and the pectoral fins are short, with 8-15 rays. The caudal fin is deeply forked and symmetrical, similar to a mackerel tail. The lateral line, when present, runs along the ventral margin of the body. Gill-rakers present, 54-70 present on the first gill arch. Precaudal vertebrae number 32-43, caudal vertebrae 21-29, and total vertebrae 54-70. Maximum size of the two large species, *Cololabis saira* and *Scomberesox saurus*, 400-450 mm SL; maximum size of the two dwarf species, *C. adocoetus*, 126 mm and *S. simulans* 68 mm.

The four species of sauries are either placed in four monotypic genera (Hubbs and Wisner 1980): *Scomberesox* and its dwarf derivative *Nanichthys*, and *Cololabis* and its dwarf derivative *Elassichthys* or in two genera, considering *Nanichthys* a synonym of *Scomberesox* and *Nanichthys* a synonym of *Cololabis* (Collette et al. 1984). Both species of *Scomberesox* develop an elongate beak; the snout increases in length in *S. simulans* throughout its life span and in *S. saurus* until a length of about 200 mm SL. The two dwarf species *Cololabis adocoetus* and *Scomberesox*

*simulans* differ convergently from the two larger species, *C. saira* and *S. saurus*, in being much smaller and losing one ovary and the swimbladder and in having fewer vertebrae, branchiostegal rays, prepectoral fin rays, and gill rakers. *Scomberesox* inhabits all three oceans, *Cololabis* is restricted to the Pacific Ocean. There is one record of the dwarf species, *Scomberesox simulans* from near St. Thomas (Hubbs & Wisner 1980), but that is the only record west of 40°W. longitude.

Sauries spend most of their life in warm homogeneous surface layers of the open sea, far from shallow continental shelf waters. They live close to the surface; so close that in English waters, where Atlantic saury are plentiful in summer, few are caught in nets as deep as 2 m. Atlantic saury are one of the most abundant epipelagic planktivores inhabiting the open part of the Atlantic Ocean, feeding mainly on siphonophores, copepods, euphausiids, amphipods, fish eggs and larvae, protozoans, algae and larvae of polychaetes, decapods, isopods, ostracods, cirripeds, and siphonophores. In winter, most Atlantic saury caught in the southern part of the area (34° N) feed on larvae of decapods, hyperiid amphipods, molluscs, and foraminiferans. Atlantic saury serve as food for many inhabitants of the sea, such as squids, swordfish, marlins, sharks, tunas, dolphins, whales, and birds. The great abundance of sauries and their wide distribution make them an important link in the epipelagic food chain of the ocean by transferring energy from lower to higher trophic levels. Sauries are valuable food-fishes in some parts of the world; Atlantic saury are important in the Mediterranean. At present, there is no fishery for saury in the northwest Atlantic, but an experimental fishery was conducted by Russian vessels during 1969-74. Sauries were caught in nets suspended from booms along the side of the vessels, the fish being attracted by bright lights.

**MERISTICS**

Vertebrae:	
Precaudal	39-43
Caudal	24-28
Total	64-70
Number of fin rays:	
Dorsal	9-12 plus 5 or 6 finlets
Anal	12-13 plus 5-7 finlets
Pectoral	12-15
Pelvic	6
Gillrakers: on first gill arch	34-45
Predorsal scales:	73-81
Branchiostegals:	13

**LIFE HISTORY**

Range: Antitropical in temperate parts of the Atlantic, Pacific, and Indian oceans. Two subspecies are recognized: the nominal subspecies, *Scomberesox saurus saurus* is broadly distributed in the North Atlantic Ocean (mostly north of 30°N) and throughout the Mediterranean Sea and *Scomberesox saurus scombroides* (Richardson) is found in the Southern Hemisphere. In the northwest Atlantic, sauries are found from Cape Hatteras to Newfoundland. The area to the west of the Gulf Stream core is their main habitat in the open sea of the northwest Atlantic, although they have been taken east of the Gulf Stream. Generally, the area of distribution extends from coastal waters eastward to 40°W and from 32°N northward to 50°N. There are scattered records at the southern limit of the range, from Bermuda, northern Florida, the Bahamas, and Cuba.

Habitat: Marine, epipelagic, usually offshore.

ELH Pattern: Oviparous, both ovaries developed; eggs slightly oval, moderately large; larvae planktonic.

Spawning: mostly offshore, between the 16.5° C. isotherm in the north and the 23.5° C. isotherm in the south

**LITERATURE:**

Letters refer to source for illustrations.

A) Boehlert 1984: fig. 20B; B-D) Hardy 1978, after Nesterov & Shiganova 1976; E) original; F) Hardy 1978: fig. 32D, after Nesterov & Shiganova 1976; G-H) Hardy 1978: fig. 33, after Nesterov & Shiganova 1976; I-L) Hardy 1978: fig. 34 after D'Ancona 1931

**EARLY LIFE HISTORY DESCRIPTION****EGGS:**

Diameter: greatest diameter 2.32-2.52 mm

No. of oil globules: none

Yolk: clear, nonvesicular

Shell: numerous, uniformly-spaced, short, rigid bristles, apparently remnants of chorionic filaments

Incubation: 14-18 days or more, apparently dependent on water temperature

Pigmentation: un-pigmented at hatching; melanophores develop on body as early as 48 hrs; first evident on yolk when embryo covers one-third of yolk surface; eyes pigmented just before hatching

**LARVAE:**

Length at hatching: 6.0-8.5 mm

Length at flexion: about 6.4 mm TL or possibly at hatching

Length at transformation: about 25 mm, based on complete development of fins & finlets

Sequence of fin development: C, A, & D; P<sub>1</sub> & P<sub>2</sub>.

Pigmentation: at hatching deep blue except fins & yolk.

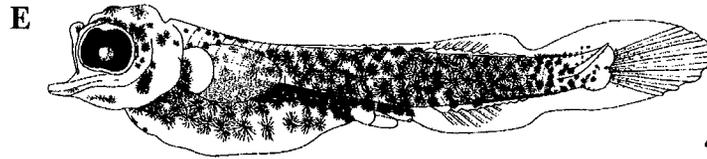
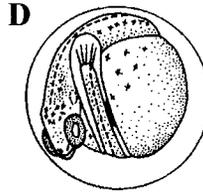
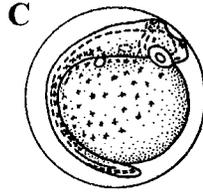
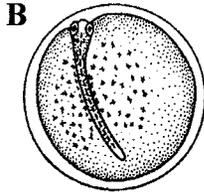
**JUVENILES:**

Pigmentation: dark blue backs & silvery sides

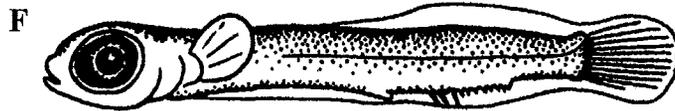
Diagnostic characters: both D & A fins are followed by finlets which develop at about 25 mm; both jaws begin to elongate at 38-40 mm.

**ILLUSTRATIONS:**

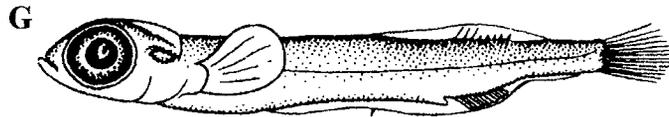
- A) egg of *S. saurus scombroides*, South Africa, chorion surface
- B) embryo with eyes, otocysts forming, pigment on yolk [H-30D]
- C) embryo with tail free [H-30-F]
- D) embryo completely around yolk, eyes pigmented [H-30H]
- E) larva, 4.4 mm SL, Gulf of Mexico
- F) larva, 6.4 mm TL, anal fin forming [H-31C]
- G) larva, 10.7 mm, dorsal fin forming [H-30D]
- H) larva, 13.0 mm TL, dorsal & anal finlets evident [H-32D]
- I) larva, 24.8 mm TL, finlets developed [H-33C]
- J) juvenile, 47.0 mm TL, jaws beginning to elongate [H-32G]
- K) juvenile, 48 mm TL, lower jaw elongating [H-34-A]
- L) juvenile, 100 mm TL, jaws and finlets developed [H-34D]



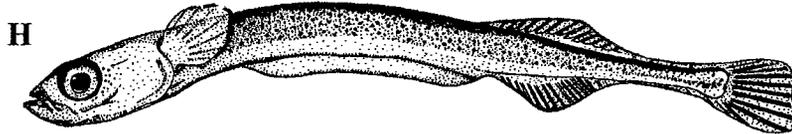
4.4 mm SL



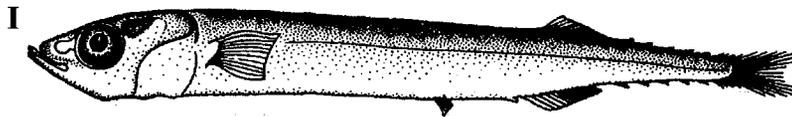
6.4 mm TL



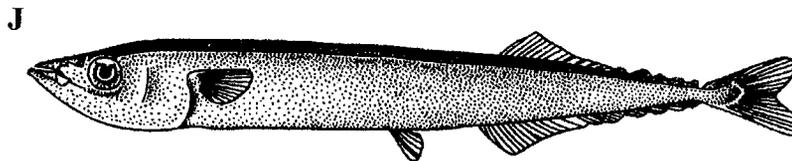
10.7 mm



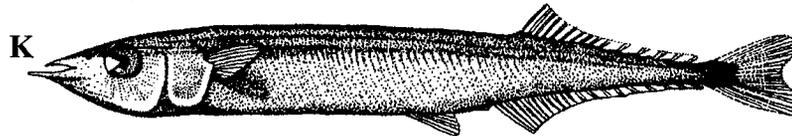
13.0 mm TL



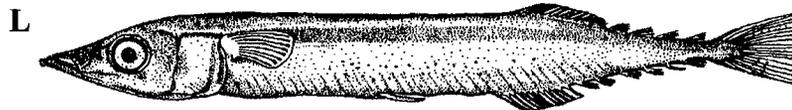
24.8 mm TL



47.0 mm TL



48 mm TL



100 mm TL

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