



## LARVAL TUNAS FROM THE FLORIDA CURRENT

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### ABSTRACT

The collection of larval fish made in the Florida Current from May 1951 to October 1956 by the personnel of The Marine Laboratory contained 146 tunas. The following were represented: (1) tuna, *Thunnus* sp. or spp., most likely young of the bluefin tuna *T. thynnus*; (2) oceanic skipjack, *Katsuwonus pelamis*; (3) little tunny, *Euthynnus alletteratus*; (4) frigate mackerel, *Auxis thazard*; and (5) 13 unidentified scombroid larvae. Capture of these larval fishes indicates that several tunas spawn in the Florida Current between March and October.

### INTRODUCTION AND ACKNOWLEDGMENTS

This paper is one of a series, originated by The Marine Laboratory, University of Miami, devoted to the study of life histories of the marine fishes of the Florida Current. Since February 1952, larval fishes have been collected by workers of The Marine Laboratory on a routine basis. The results in this paper are based on material from the collection of the National Geographic Society-Marine Laboratory, University of Miami Pelagic Fish Life History Program.

A number of larval scombroids have been collected in the Straits of Florida in the course of this program. The author was able to separate and identify young forms of several species of tunas.

I wish to thank Dr. Gilbert L. Voss of The Marine Laboratory for loan to the Inter-American Tropical Tuna Commission of the collection of larval scombroids. I am grateful to Dr. F. G. Walton Smith, Director, Marine Laboratory, for permission to publish the findings.

### METHODS AND MATERIALS

The material upon which this study is based was collected by personnel of The Marine Laboratory in the Straits of Florida between May 1952 and September 1956.

The entire material originates from plankton tows made mostly at routine stations. Miller *et al.* (1953), Voss (1954), Bsharah (1957), and McKenney (1959) have already described the methods employed by The Marine Laboratory in the collection of plankton.

Table 1 lists the stations at which larval tunas were taken, together with details as to the time, place, and depth of tow.

All specimens, which were preserved in formalin, were examined under a binocular microscope and measurements were made with a

TABLE 1  
LARVAL TUNAS FROM THE FLORIDA CURRENT

Station No.	Date	Locality Latitude N. Longitude W.	Time	Depth (m)	Thunnus sp. indet.		Katsuwonus pelamis		Auxis thazard		Euthynnus alletteratus		Unidentified	
					No.	Size (mm)	No.	Size (mm)	No.	Size (mm)	No.	Size (mm)	No.	Size (mm)
NG-25,A	5,26,1951	25°35'	1105	25	2	7.3,7.4							1	5.2
NG-26,A	6,5,1951	"	1020	25	4	6.7-8.0								
NG-27,B	6,19,1951	"	0915	45	1	5.6								
NG-28,A	7,3,1951	"	0925	40			3	5.4-13.0						
NG-29,A	7,13,1951	"	0900	31	1	5.0								
NG-30,A	8,2,1951	"	0945	25	1	9.1								
NG-31	8,7,1951	25°34.5'	1107	0	1	5.5								
NG-32,5	8,13,1951	"	1140	167	1	5.2								
NG-32,19	8,13,1951	"	2250	40	3	4.6-6.0	1	3.9					1	3.8
NG-32,26	8,14,1951	"	0330	75	1	8.5							1	8.0
NG-32,37	8,14,1951	"	0730	50									2	7.0,7.7
NG-40,A	3,3,1952	"	0845	0										
SL-14,E-0	3,20,1953	25°35'	0800	0	1	6.8								
SL-15,A-1	4,23,1953	"	2020	46			1	5.7						
SL-15,B-0	4,23,1953	"	2255	0			1	6.9						
SL-15,C-0	4,24,1953	"	0250	0			1	6.4					1	4.8
SL-16,A-0	5,21,1953	"	0310	0									1	5.2
SL-16,A-1	5,21,1953	"	0310	55	1	5.9			1	4.7				
SL-16,B-0	5,21,1953	"	0913	0	3	4.9-7.9								
SL-16,B-1	5,21,1953	"	0913	55	1	6.1								
SL-16,C-3	5,21,1953	"	1655	238										
SL-16,D-0	5,21,1953	"	2035	0	3	5.7-6.1							1	5.7
SL-16,D-4	5,21,1953	"	2140	366			1	4.5						
SL-17,A-0	6,11,1953	"	1640	0	4	5.5-8.9								
SL-17,B-0	6,11,1953	"	1838	0	15	4.2-8.5							1	5.3
SL-17,B-1	6,11,1953	"	1838	68	1	5.4								
SL-17,C-0	6,11,1953	"	2315	0	3	6.6-10.0			1	5.3				
SL-17,C-3	6,12,1953	"	0015	274	6	4.0-6.5								

TABLE 1 (Continued)  
LARVAL TUNAS FROM THE FLORIDA CURRENT

SL-17,D-0	6,12,1953	"	"	0235	0	7	4.4-6.6	1	7.0	
SL-17,E-0	6,12,1953	"	"	0540	0	2	5.0,5.4			
SL-17,F-1	6,12,1953	"	"	1015	68			1	8.8	
SL-18,C-0	7,2,1953	"	"	0610	0	4	4.2-5.3			
SL-18,D-0	7,2,1953	"	"	1040	0					1 4.0
SL-18,E-0	7,2,1953	"	"	1515	0	3	4.3-7.2			
SL-19,A-0	8,13,1953	"	"	1430	0	3	5.0-6.2			
SL-19,B-0	8,13,1953	"	"	2027	0	2	6.5,6.9			
SL-19,B-1	8,13,1953	"	"	2027	48	1	4.7			1 5.0
SL-19,B-3	8,13,1953	"	"	2138	274					
SL-19,C-0	8,14,1953	"	"	0130	0	1	6.2			
SL-19,C-5	8,14,1953	"	"	0408	448			1	7.0	
SL-19,D-0	8,14,1953	"	"	0640	0	2	6.5,9.0			
SL-19,D-2	8,14,1953	"	"	0640	137				1 4.7	
SL-19,E-0	8,14,1953	"	"	0640	0	6	5.0-6.5			
FR-47	5,7,1955	25°34.5'	79°19.3'	1015	0	1	5.4			
FR-57	7,24,1955	25°43.5'	79°19.7'	0938	0	1	5.0			
SL-37,C-1	8,8,1955	25°35'	79°25'	2315	50					
FR-62	8,29,1955	25°03'	75°20'	1235	0	1	7.8			1 5.6
SL-40,A-3	10,4,1955	25°35'	79°25'	2345	144			1	7.4	
SL-40,B-7	10,5,1955	"	"	0145	288	1	7.1			
SUPL 58	4,5,1956	25°34.5'	79°19.7'	0907	0			1	7.4	
SUPL 66	6,5,1956	25°43.5'	79°19.7'	1830	0	13	4.0-5.5			
SUPL 74	6,6,1956	25°40'	79°19.5'	1820	0	6	4.5-7.5			
SUPL 78	6,6,1956	"	"	1745	0	1	6.0			
SUPL 82	5,7,1956	"	"	1810	0					1 4.6
SUPL 83	5,8,1956	25°46.2'	79°19.5'	1745	0	1	4.8			
SUPL 86	6,11,1956	25°43.5'	79°19.7'	1810	0	3	4.9-5.5			
SUPL 88	6,13,1956	25°32.5'	79°18'	1655	0	1	4.9			
SUPL 102	5,15,1956	25°33.3'	79°17.5'	1800	0	1	7.9			
SUPL 107	5,16,1956	25°40'	79°19.5'	1845	0	2	4.9			
SL-45,A-0	9,13,1956	25°35'	79°25'	0400	0	1	7.3			

micrometer eyepiece. The measurement of total length represents the direct distance from the tip of the snout to the tip of the shortest median ray of the caudal fin.

For convenience, the author followed the taxonomic nomenclature of Rivas (1951), with the exception of employing *Thunnus albacares* in place of *T. argentivittatus* for the Atlantic yellowfin tuna.

## RESULTS

*Identification of young tunas.* A total of 146 larval scombroids are present in all collections, among which the following genera and species have been identified: *Thunnus* sp. or spp., *Katsuwonus pelamis*, *Auxis thazard*, and *Euthynnus alletteratus*. In addition, 13 larvae, ranging in length from 3.8 to 8.0 mm, could not be assigned to any of the genera or species. These individuals were mostly damaged or poorly preserved.

*Thunnus* sp. *indet.* One hundred and seventeen individuals ranging in total length from 4.0 to 10.0 mm are present in this group. These larvae were collected between March and October, with the main catches between May and June (Table 1). All these specimens coincide in their general appearance with published descriptions and illustrations of larval *Thunnus* (*sensu lato*). Since even the largest individuals are too small for critical examination of bony parts, or for establishment of the number of gill rakers, specific identification has not been attempted.

Klawe and Shimada (1959) have discussed possibilities of occurrence of various species of the genus *Thunnus* in waters of the Gulf of Mexico. In general the same arguments are valid for waters of Straits of Florida, the difference being that the occurrence of *T. obesus*, bigeye tuna, in those waters has been substantiated (Mather and Gibbs, 1958). Therefore, as many as five species of genus *Thunnus* may be encountered in the Straits of Florida: the bluefin tuna *T. thynnus*, yellowfin tuna *T. albacares*, blackfin tuna *T. atlanticus*, bigeye tuna *T. obesus*, and albacore *T. alalunga*. Of these, at the present time, albacore has been caught only off Jamaica and Hispanola in the western Atlantic Ocean (Bullis and Mather, 1956). As Rivas (1954) has presented an array of evidence that *T. thynnus* spawn in the Straits of Florida in May and early June, very possibly many or all of the *Thunnus* larvae in this collection are those of *T. thynnus*.

Oceanic skipjack, *Katsuwonus pelamis*. This species is represented by 11 specimens of total lengths 3.9 to 13.0 mm. These individuals

were captured in the months of April, June, August, and October (Table 1).

Frigate mackerel, *Auxis thazard*. Four specimens of frigate mackerel are present in the collection. These individuals range in size from 4.7 to 7.0 mm. These larvae were captured in May, June, and August (Table 1).

Little tunny, *Euthynnus alletteratus*. A single individual of length 8.8 mm was caught in June (Table 1).

*Spawning of tunas in the Straits of Florida.* The presence of larval tunas in this area indicates recent spawning, because (1) the incubation time of tuna eggs is short (Vodyanitsky, 1936; Schaefer, 1956), (2) young tunas grow rapidly (Clemens, 1956), (3) the passive displacement of eggs and newly hatched larvae by the Florida Current is probably not extensive. The last statement requires qualification. Although, in general, the currents in the Straits of Florida are relatively

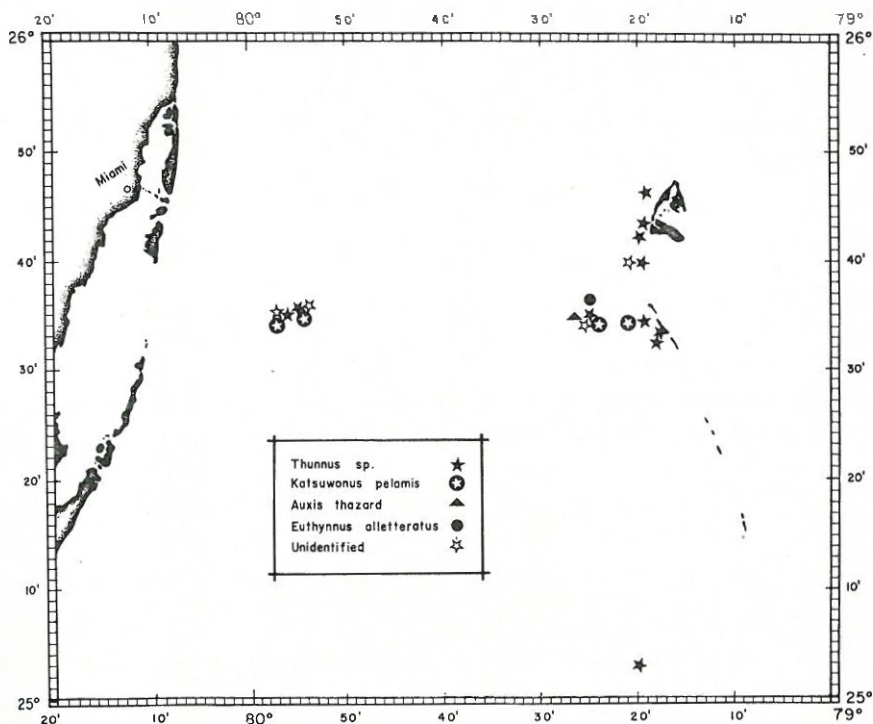


FIGURE 1. Localities of capture of larval tunas identified from The Marine Laboratory collection in the Florida Current.

large, most of the collections were made off Miami (Figure 1) where the speed of surface currents is considerably increased, but the speeds down the stream are not too large (Hela, 1954) and therefore the passive transportation into the area of capture could not be very rapid.

From the number of different larvae captured in the Straits of Florida it appears that the spawning of *Thunnus* sp. or spp. is much more extensive than that of *Katsuwonus pelamis*, *Auxis thazard* and *Euthynnus alletteratus*.

The dates of captures given in Table 1 provide a basis for inference as to the time of spawning of the several tunas in the Straits of Florida. The months in which larval forms were collected in some or all of the years represented in the collections are as follows:

	March	April	May	June	July	Aug.	Sept.	Oct.
<i>Thunnus</i> sp. or spp.	x		x	x	x	x	x	x
<i>Katsuwonus pelamis</i>		x	x		x	x		x
<i>Auxis thazard</i>			x	x		x		
<i>Euthynnus alletteratus</i>				x				

The unidentified larval tunas were collected between March and August. From the foregoing it appears that at some time or other during the period from March through October several of the tunas in the waters of Straits of Florida engage in reproductive activity.

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