

OCCURRENCE OF SLENDER TUNA (*ALLOTHUNNUS FALLAI*) OFF SAO PAULO STATE, BRAZIL

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SUMMARY

Allothunnus fallai is a monotypic genus species and was first described by Serventy in 1948. Slender tuna is included in the tribe Thunnini being considered the most basal tuna species. The only occurrence in Brazilian waters of slender tuna was the presence of three larvae found in stomach contents of tunas caught by longline (1972-1978) off southern of Brazil, described by Zavala-Camim and Seckendorff in 1980. There are few articles about this species in the Atlantic Ocean. An adult female was incidentally caught at (5m deep) Jose Menino beach 23°58'07"41S - 46°20'23"92W in Santos City, Sao Paulo State, Brazil, by handling beach trawl seine on October, 30, 2009.

RÉSUMÉ

Le thon élégant (*Allothunnus fallai*) est une espèce de genre monotypique qui a été décrite pour la première fois par Serventy en 1948. Le thon élégant est inclus dans la tribu Thunnini et il est considéré comme l'espèce thonière la plus basale. La seule fois que le thon élégant est apparu dans les eaux brésiliennes a été sous la forme de trois larves découvertes dans les contenus stomacaux de thons capturés à la palangre (1972-1978) au large du Brésil, expérience décrite par Zavala-Camim et Seckendorff en 1980. Il existe peu d'articles sur cette espèce dans l'océan Atlantique. Une femelle adulte a été capturée accidentellement à une profondeur de 5 m au large de la plage de Jose Menino (23°58'07"41S - 46°20'23"92W) à Santos City, Etat de Sao Paulo (Brésil) par une senne de plage tirée par un chalutier le 30 octobre 2009.

RESUMEN

El *Allothunnus fallai* es una especie de género monotípico que fue descrita por primera vez por Serventy en 1948. El atún lanzón se incluye en el grupo de túnidos considerados como las especies de túnidos más basales. En aguas brasileñas, la única presencia detectada de atún lanzón se restringió a tres larvas halladas en los contenidos estomacales de túnidos capturados con palangre (1972-1978) en las aguas al Sur de Brasil, descritas por Zavala-Camim y Seckendorff en 1980. Hay pocos artículos sobre esta especie en el océano Atlántico. Se capturó de forma incidental (a 5 m de profundidad) una hembra adulta en la playa de Jose Menino 23°58'07"41S - 46°20'23"92W en Santos City, estado de Sao Paulo, Brasil, con un cerco de playa el 30 de octubre 2009.

KEYWORDS

Tribe Thunnini, handling beach trawl seine, incidental catch

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1. Introduction

The Scombridae is a family composed of 15 genera and 49 species of mostly epipelagic marine fishes, the mackerels, spanish mackerels, bonitos, and tunas, the family is divisible into two subfamilies the Gasterochismatinae, and the Scombrinae (Collette and Nauen, 1983). The subfamily Scombrinae had been divided into two groups of tribes: Thunnini comprehended 5 genera and 14 species and Sardine 4 genera and 7 species.

All Thunnini species are large, active, pelagic species with high energy demands that undertake long-distance migrations and move vertically within the water column, thereby encountering a range of water temperatures (Dickson and Graham, 2004).

The first systematic position of the monotypic genus *Allothunnus* considered that the slender tuna was a member of the tribe Sardine but according to Graham and Dickson (2000) discovered that this species has a highly modified central circulation, similar to the central heat-exchanging retia of certain tunas, an enlarged haemal arch to accommodate this structure, and the anterior, internal placement of red muscle characteristic of tunas. Also, it with these new characters, phylogenetic reconstructions based on parsimony place *A. fallai* as the sister taxon to the tunas (Thunnini), establish that it is the most basal tuna species. Field studies on the slender tuna, *Allothunnus fallai* revealed cranial temperatures that were about 4° to 8° C above the ambient sea surface temperature, documenting the cranial heat source revealed a fused extraocular muscle complex positioned beneath the brain of this basal tuna species. In *A. fallai*, all four extraocular rectus muscle pairs are incorporated into one distinct tissue complex which is positioned between the orbits and in direct contact with the braincase, being the first record of a cranial modification comprised of all four rectus muscles and the only documented occurrence of this mechanism for cranial endothermy among the tunas. (Sepulveda and Graham, 2004; Sepulveda *et al* 2007, 2008).

The *Allothunnus fallai* was described by Serventy (1948) from three specimens, in New Zealand. The species differs from all other scombrids in its very high number of gill rakers and having laterally extended prootic wings (Collette and Chao, 1975).

This article intends to register the occurrence of the rare slender tuna, *Allothunnus fallai* inshore of Santos City, Sao Paulo State, Brazil and discuss the biological features of it.

2. Material and methods

It was caught in handling beach trawl seine incidentally at ~ 5m deep on October, 30th, 2009 by the vessel Ivan Mar. The specimen has been deposited in the fish collection of the Núcleo de Pesquisa e Estudo em Chondrychthyes-NUPEC under number 2193.

The exemplar was identified based on Collette and Nauen (1983) and measured through Collette and Astarloa (2008).

3. Results and discussion

A female slender tuna of 68,5 cm fork-length (**Table 1**), 3.9 kg, was caught inshore at Jose Menino beach (23°58'07"41S - 46°20'23"92W), Santos City, Sao Paulo State, Brazil and donated by the fisherman, Antonio Giufrida. The temperature ranged from 23° and 25°C. This species is very rare and according to the fisherman with 15 years fishing in this area it was the first occurrence of this species.

The slender tuna never seen before in Brazilian waters, except the presence of three larvae (ranging from 53 mm to 54 mm) found in stomach contents of tunas caught by longline (1972-1978) in southern of Brazil (Zavala-Camim and Seckendorff, 1980). Therefore Mori (1967a) had already registered the occurrence of larvae of *Allothunnus fallai* in the South Atlantic Ocean.

There are few articles about this species in the Atlantic Ocean. Tominaga (1966) described first appearances of slender tuna from Uruguayan waters (South Atlantic). One exemplar was recorded in Tristan da Cunha island (37°05'S–12°17'W), situated in midway between south Africa and south America (Andrew *et al*, 1995). An adult

male, 78.4 cm fork length was taken in the South Atlantic, at 53°25'S-64°23'W off Tierra del Fuego, Argentina (Collete and Astarloa, 2008).

From 1982 to 1989 a series of driftnet surveys of Japan Marine Fishery Resources Research Center (JAMARC) revealed that the species is very abundant in South Pacific subtropical and subantarctic waters (Yatsu, 1995). According to Graham and Dickson (2004) *Allothunnus fallai* occurs exclusively in the temperate Southern Ocean. These tuna were caught south of latitude 38°S. in Pacific, Indian and Atlantic Oceans, and were found in waters less than 100 m in depth, near islands and continents (Wove and Webb 1975). Juveniles are principally encountered between 20 and 35 °S at surface temperatures ranging from 19 to 24° C. With increasing size they gradually move into higher latitudes where water temperatures are lower (Collete and Nauem 1983). Mori (1972) describe the species presence in Palau Island (Pacific Ocean).

All tunas, with the exception of *Allothunnus*, spawn in warm waters (Graham and Dickson, 2004). It prefers subtropical waters and the Peru Current north of 31° SW were considered to be spawning grounds of slender tuna during October, November, December. From November to February, feeding grounds were located in subantarctic waters and the Peru current South of 38°S, making seasonal migrations from subantarctic and transitional waters to subtropical waters, coupled to seasonal geographic shifts in biomass of epipelagic subantarctic zooplankton (Yatsu 1995).

Allothunnus fallai was considered to be a highly migratory species, with a life- style adapted to the seasonally fluctuating biomass of zooplankton in subantarctic epipelagic waters (Yatsu 1995).

In spite of the specimen was considered of cold waters and pelagic, it was found in subtropical water between 23° and 25°C, inshore at Jose Menino beach, Santos City, Sao Paulo State, Brazil.

Diets of *A. fallai* consists in euphausiids, squids, copepods, fish and amphipods (O'Brien, 1988; Yatsu, 1995; O'Driscoll and Mc Clatchie, 1998). Mori (1967b) found 1 to 19 *Halobates* in the stomachs of 4 young slender tuna caught on tuna longline in the South Pacific Ocean (28°30'S-116°15'W).

In the stomach content of the found specimen there was the presence of plastic material only.

On basis of observations in brain morphology (Uchihashi, 1970), together with the presence of well-developed gill rakers (Nakamura and Mori, 1966; Warashina and Hisada, 1972) concluded that *A. fallai* is an epipelagic plankton feeder. The feeding habits of the species on the high seas have not been documented.

Adult slender tuna were preyed upon *Isurus oxyrinchus*, *Prionace glauca*, *Xiphias gladius* and *Makaira mazara* in subtropical waters (Yatsu 1995). Although tunas and billfishes are of large economic importance and increasing conservation concern, global distribution patterns of many species are poorly resolved. By virtue of their ability to maintain elevated body temperatures, tuna and billfish are able to swim at high speeds over great distances and inhabit a wide range of water temperatures (Boyce, 2004).

4. Conclusion

It was an unusual occurrence of *Allothunnus fallai* nevertheless this fact may contribute to the distribution and behavior and aiming the species conservation.

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Table 1. Proportion dimensions percentages of fork length in specimens of *Allothunnus fallai*.

Sex	<i>Collette & Astarloa 2008</i>		<i>NUPEC 2193</i>	
	Male		Female	
Measurement	mm	%	mm	%
Fork length	784	100	685	100
Head length	204	26,0	176	25,7
Snout to first dorsal fin	235	30,0	215	31,4
Snout to second dorsal fin	494	63,0	424	61,9
Snout to ventral fin	223	28,4	197	28,8
First dorsal fin base	247	31,5	205	29,9
Second dorsal fin base	59	7,5	48	7,0
Anal fin base	55	7,0	48	7,0
Pectoral fin length	113	14,4	89	13,0
Anal fin length	67	8,5	59	8,6
Eye diameter	32	4,1	25	3,6
Maxilla length	78	9,9	58	8,5
Snout to posterior border of eye	88	11,2	78	11,4

<i>Meristics</i>		
Dorsal-fin spines	17	16
Dorsal-fin rays	13	12
Dorsal finlets	7	7
Anal-fin rays	13	13
Anal finlets	7	7
Pectoral-fin rays	25	27
Gill rakers	74	73

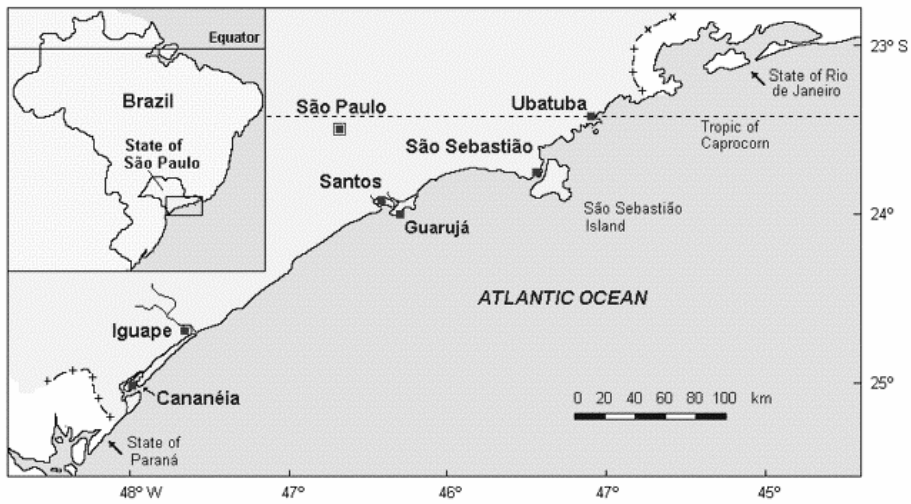


Figure 1. Catch area of *Allothunnus fallai* (November 30, 2009).



Figure 2. Specimen collected in Santos City, Brazil.