

## *Thunnus alalunga* (Albacore Tuna)

Family: Scombridae (Mackerel, Tunas and Bonitos)

Order: Perciformes (Perch and Allied Fish)

Class: Actinopterygii (Ray-finned Fish)



**Fig. 1.** Albacore tuna, *Thunnus alalunga*.

[[http://www.findeatdrink.com/Index/Purveyors/Entries/2011/7/5\\_wild\\_pacific\\_albacore\\_tuna.html](http://www.findeatdrink.com/Index/Purveyors/Entries/2011/7/5_wild_pacific_albacore_tuna.html)], downloaded 19 March 2015]

**TRAITS.** The average size of this tuna is about 1.4m and it may weigh up to 60kg (Wikipedia 2015). *Thunnus alalunga*'s body contains many small, cycloid scales (with rounded free edges) on its surface and is torpedo-shaped, sleek and streamlined. Its fins are cone-shaped and sharp. *Thunnus alalunga* has the widest breadth at the middle of its body and tapers at the anterior end but more so at the posterior end after the anal fin. The pectoral fin which is nearly half the length of the tuna's body is exceedingly long (Fig. 1). Fish which are smaller than 50cm have proportionately smaller pectoral fins than other tunas. The fins of the albacore also consist of 7-9 dorsal finlets, 7-8 anal finlets, and two dorsal fins, the first of which is larger (Fig. 1). The dorsal side of the tuna is iridescent dark blue and the ventral side consists of shades of blue-grey and silvery white. A swim bladder is present but it is underdeveloped and not visible in fish smaller than about 50cm.

**DISTRIBUTION.** The albacore tuna is cosmopolitan in warm temperate and tropical waters of all oceans, and it is also found in the Caribbean and Mediterranean Seas.

**HABITAT AND ACTIVITY.** *Thunnus alalunga* is an epipelagic and mesopelagic oceanodromous species which is found in surface waters of 15.6-19.4 °C. However, larger albacore are abundant in waters of a wider range of temperatures, 13.5-25.2 °C, and some fish may be able to tolerate temperatures as low as 9.5 °C for small amounts of time. Albacore tend to concentrate

along thermal discontinuities such as the Transition Zone in the north Pacific. Albacore favour the Transition Zones over cooler upwelling waters as these contain less oxygen but more food organisms. The highly migratory albacore roam within water masses instead of across oxygen or temperature boundaries. Throughout the range of the albacore, it migrates over large distances and apparently forms different groups at different phases of its life cycle. Albacore tuna reside in waters with depths ranging from 0-600m. In the Pacific, albacore are present from the surface to about 380m and in the Atlantic, albacore thrive in depths up to 600m. The eggs and larvae of albacore tuna are also pelagic.

**FOOD AND FEEDING.** The large albacore tuna consumes around 25 % of its weight daily and it is also one of the top carnivores and opportunistic feeders within the regions of the ocean it resides in. Size is a major determinant for the type of diet each albacore has. Smaller juvenile *T. alalunga* feed almost solely on planktonic crustaceans whereas larger juveniles prey on a combination of squid, small fish and crustacea including *Cololabis saira*, *Engraulis mordax*. Mature albacore feed on squid and some small fish (Bailey 1983). Time of day is also a determinant for the type of diet of albacore tuna. Juvenile albacore primarily feed in the morning and early evening. Also, in deeper layers of water, crustacea dominates the diet of the albacore however, typically, 96 % of the contents of *T. alalunga*'s stomach is anchovy at any given time. Albacore also follow their prey throughout the column of the water exhibiting a diel vertical migration pattern (Bernard et al., 1985; Watanabe et al., 2004). The albacore tuna itself is preyed on by larger species of tuna, sharks and billfish, so it is not a top predator.

**POPULATION ECOLOGY.** *Thunnus alalunga* always exists in groups or schools (Fig. 2) and become agitated if separated from their group. Albacore are said to be obligate shoalers as it is necessary for their survival to exist in groups. Similarly to other tunas, albacore form schools with few fish. When schools of larger fish are formed, the unit is more compact. Mixed schools are also formed with other tuna species *Katsuwonus pelamis*, *Thunnus albacares* and *Thunnus maccoyii*. Formation of schools is sometimes associated with floating objects such as sargassum weeds as schools are formed around the weeds. This species of tuna is extremely abundant and widely distributed as it is cosmopolitan in warm temperate and tropical waters of all oceans. Albacore tuna have a lifespan of about 11 years but its longevity in the South Atlantic and South Pacific can be up to 13 years. Maturity is reached at about 5 years.

**REPRODUCTION.** Albacore spawn collectively by releasing their gametes into the surrounding water (Collette and Nauen, 1983). Albacore are iteroparous and breed seasonally over several years. Females scatter their eggs in the ocean, and fecundity increases with size. A 20kg female may produce 2-3 million eggs per season which is released in at least two batches; however, the majority of these eggs do not survive to adulthood. Each egg is approximately 1mm in diameter and contains an oil droplet which ensures that it maintains buoyancy in the ocean. After the eggs are fertilized by the male, development is rapid and hatching occurs within the next 48 hours. Albacore tuna larvae increase in size very quickly after hatching occurs and for the first year of their lives, they remain near to the place where they were hatched. Sexual maturity is reached at about five years (Santiago and Arrizabalaga, 2005). No parental investment is made by albacore other than the energy used for migration to grounds of spawning and the contribution of gametes.

**BEHAVIOUR.** Minimal details are readily obtainable on how *T. alalunga* perceive their surroundings and communicate with other organisms. However, perception of their environment is most likely carried out via tactile, auditory, visual and chemical means as this is the way most fish perceive their surroundings (Von der Emde et al., 2004). Studies have shown that juvenile *T. alalunga* have migratory habits. These juveniles move vertically and horizontally through a wide range. These movements are region-specific and season-specific and linked to availability of food and oceanographic conditions. Albacore have competitors which feed on similar prey such as skipjack, yellowfin and bigeye tunas. In turn, albacore are preyed on by sharks, billfish and dolphins.

**APPLIED ECOLOGY.** Albacore tuna are listed by the IUCN as a near threatened species as it is considered to be threatened with extinction in the near future although it is not currently considered to be threatened. This is the case because a major fishery exists for the commercially important *T. alalunga* as the fish are marketed and sold as canned white meat tuna. This species is caught by long-line fishing (Fig. 3), live-bait fishing, seine fishing, and trolling. Several actions have been taken to ensure that albacore tuna are harvested responsibly. Adjustments to the total allowable catch of albacore tuna in the northern and southern Atlantic have been made to help conserve this species. Moreover, driftnet fishing of albacore has been banned in the European Union countries as well as the ICCAT Mediterranean countries.

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**Fig. 2.** A school of albacore tuna.

[<https://www.worldwildlife.org/species/albacore-tuna>, downloaded 1 April 2015]



**Fig. 3.** Albacore tuna caught on a longline.

[[http://www.redorbit.com/education/reference\\_library/animal\\_kingdom/fish/1112506009/albacore/](http://www.redorbit.com/education/reference_library/animal_kingdom/fish/1112506009/albacore/), downloaded 1<sup>st</sup> April 2015]

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