

Tilefish

Lopholatilus chamaeleonticeps Goode and Bean 1879

[Jordan and Evermann, 1896-1900, p. 2278.]

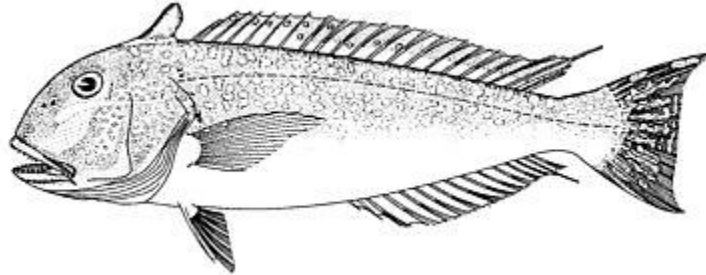


Figure 221 - Tilefish (*Lopholatilus chamaeleonticeps*), off Marthas Vineyard. From Goode. Drawing by H. L. Todd.

Description

The presence of a thin, high, fleshy, finlike flap on the nape of the neck in front of the dorsal fin, close behind the eyes, suggesting the adipose fin of the salmon tribe in its appearance though not in its location, serves to identify the adult tilefish at a glance among Gulf of Maine [page 427] fishes. In grown fish this flap is as high as the dorsal fin, higher than long, and rounded at the tip. In small fry it is relatively much lower. Equally distinctive, if less conspicuous, is a smaller fleshy flap situated on the side of the lower jaw close to the angle of the mouth, pointing backward (to be seen in the illustration, fig. 221). The large head is strongly convex in dorsal profile but nearly flat in ventral profile, with the eye high up, the mouth wide, and both the jaws are armed with an outer series of large conical teeth and inner rows of smaller teeth. The trunk (moderately flattened sidewise) is deepest close behind the head, tapering thence backward to the sidewise-flattened caudal peduncle. The spiny and soft portions of the dorsal fin are continuous, extending back from above the gill opening almost to the base of the caudal fin, as is the case in cunner, tautog, and rosefish. But the anal fin (14 or 15 rays) of the tilefish is about half as long as the dorsal fin, under the rear (soft-rayed) part of which it stands, and like the latter it is of nearly even height throughout most of its length except that its forward corner is rounded. The ventral fins are located below the pectorals, which are set low down on the sides, and both the pectorals and the ventrals are pointed. The gill covers, as well as the trunk, have moderately large scales.

Color

This is a brilliant fish, bluish or olive green on the back and on the upper part of the sides, changing to yellow or rose lower down on the sides; its belly is of the latter tint with white midline. The head is tinged reddish on the sides; pure white below. The back and sides above the level of the pectorals are thickly dotted with small irregular yellow spots, which are particularly conspicuous below the adipose dorsal flap. The dorsal fin is dusky, marked with similar but larger yellow spots, its soft-rayed portion pale edged. The adipose flap is greenish yellow; the anal fin pale pinkish clouded with purple and with bluish iridescence; and the pectorals are pale sooty brown, with purplish reflections near their bases.

Size

Tilefish have been reported up to 50 pounds in weight, but this is unusual. The largest fish we have seen (an unripe female) weighed 35½ pounds and was about 42 inches (108 cm.) long. Measurements taken by Bumpus[99] and more recently by us on the Grampus show that a 40-inch fish may be expected to weigh about 30 pounds; fish of 33 to 36 inches, 20 to 21 pounds; and 30- to 32-inch fish, 17 to 18 pounds.

Habits

This is a bottom fish, and its depth range off our Atlantic coast is a very narrow one, none ever being taken shoaler than about 45 fathoms,[1] and very few much deeper than 100 fathoms. The deepest definite record with which we are acquainted is 170 fathoms (p. 428), and with the best fishing at 60-90 fathoms. In the Gulf of Mexico it has been caught at 90 fathoms. The thermal range to which the tilefish is exposed, normally, is very narrow also, for the temperature of the bottom water along the zone inhabited regularly by it varies only between about 47° and about 53°, in most years, summer or winter. And it appears to be very sensitive to chilling; [page 428] this having been the probable cause of a mass destruction of tilefish that took place in 1882 (for further discussion, see p. 429). It is not known whether the tilefish is equally sensitive to high temperatures, in any case it could escape such by descending to a greater depth.

Food

A great variety of bottom-dwelling invertebrates have been taken from tilefish stomachs. Crabs, of which they are often packed full, are the most important article of diet. The list[2] also includes squid, shrimp, shelled mollusks, annelid worms, sea urchins, sea cucumbers, and sea anemones. Occasionally they catch other fish; two spiny dogfish, for instance, were found in one, and an eel (probably a conger or a slime eel) and unidentified fish bones in others.[3] the presence of pelagic amphipods (Euthemisto)[4] and of salpae in the stomachs of tilefish caught on long lines proves that they sometimes feed at higher levels, but they are never known to rise to the surface voluntarily, and when they are hauled up they are often "poke blown." Tilefish take any bait, perhaps menhaden best, salt herring not so readily.

Although they are strong active fish, it is probable that they suffer from the attacks of sharks, for fish caught on the long lines are often bitten in two. And we have seen numbers of sharks 7 to 8 feet long (species not determined) following them up to the surface, while the line was being hauled.

Ever since the tilefish was discovered it has been known to spawn in July, and eggs were running from 10 out of 11 females caught by the Grampus off New York on August 3, 1916, while the roe of the eleventh was still unripe. How early the spawning season may open is still to be learned, but August probably sees its close, for the majority of 18 females caught on the 26th of that month in 1914 were spent, only one or two still having running eggs. Among the fish that we have examined, the females have greatly predominated (only 1 male to 29 females in a total of 39 individuals).

Ripe eggs taken from a tilefish and preserved in formalin measured about 1.25 mm. in diameter.[5] As they had an oil globule of 0.2 mm., it is safe to say that they are buoyant, and tow nettings yielded eggs, indistinguishable from those stripped from the tilefish, at the station where we caught the ripe females just mentioned. But the larval stages have not been seen. The fact that a few tilefish of $2\frac{1}{2}$ to $3\frac{1}{3}$ inches were taken along the outer edge of the continental slope in April 1930, and others of 4 to $4\frac{1}{3}$ inches in July, suggests that 4 to 5 inches is the usual length at one year of age.[6] Nothing is known of the subsequent rate of growth, nor at what age the tilefish matures sexually.

General range

Outer part of the continental shelf and upper part of the continental edge off Nova Scotia and off the North and Middle Atlantic United States, from Banquereau Bank to the offing of Chesapeake Bay, in depths of 45 fathoms to perhaps 200 fathoms; also reported from southern Florida in more than 100 fathoms,[7] and from the Campeche Bank in the southern side of the Gulf of Mexico, whence the Museum of Comparative Zoology has received a specimen taken in 90 fathoms by the schooner Seminole on February 1, 1946,[8] and where local fishermen report that they have taken a number.

Occurrence off Nova Scotia and off the North and Middle United States

The most easterly and northerly records for the tilefish are of a small one caught on Banquereau Bank (lat. $44^{\circ}26'$ N., long. $57^{\circ}13'$ W.) in 170 fathoms, December 15, 1902, from the schooner Monitor out of Gloucester,[9] and of another of $4\frac{1}{2}$ pounds that was brought in to Boston in 1933.[10]

Its chief center of abundance is between the offings of Nantucket and of Delaware Bay. And there is some evidence that it ranges farther east in warm years than in cold. In 1908, for example, tilefish were caught off the South Channel (long. about 69°) in September, while in 1950 the Albatross III trawled a few at 50-80 fathoms nearly that far east (at longitudes $69^{\circ}57'$ to $69^{\circ}35'$ W.) in May, whereas the Grampus caught none off Martha's Vineyard (long. between 70° and 71° W.) in the very cold July of 1916, but made a fair catch off New York.

On the other hand, none have been reported alive off the Atlantic coast below lat. $37^{\circ}29'$ N., a few miles north, that is, of the mouth of Chesapeake Bay, which makes it likely that the tilefish of southern Florida and of the Gulf of Mexico are isolated populations.

The onshore-offshore range of the tilefish off our northern coasts, being limited in depth (p. 427), is confined to a bottom belt only some 15 to 25 miles wide—astonishingly narrow for so large a fish and one that is so plentiful. And presumably it is a year-round resident wherever it is found there, for its presence has been established northward to the offing of southern New England as early in the season as March, and as late as January, while there was no general falling off in the catches in autumn and early winter during the only year (1917-1918) for which monthly data are available.

Though the tilefish has been reported only once well within the limits of our Gulf, its history and its relationship to hydrographic factors are so interesting that it deserves more attention than its status as a Gulf of Maine fish would warrant otherwise.

It is astonishing that the very existence of so large a fish so close to our coast should have remained unsuspected until May 1879, when Captain Kirby, cod fishing in 150 fathoms of water south of Nantucket Shoals Lightship, caught the first specimens. Others were caught at 87 fathoms nearby by the schooner Clara T. Friend (Capt. William Dempsey) during the following July. And trips by the United States Fish Commission during the next two summers proved that the tilefish were plentiful enough to support an important new fishery. These early investigations likewise proved that it occupies a very definite environment, along the upper part of the continental slope and on the outer edge of the shelf where a narrow band of the sea floor is bathed with a belt of warm water (about 47° to 53°), varying by only a couple of degrees in temperature from season to season, and that it never ventures into the lower temperatures on the shoaling bottom nearer land, nor downward into the icy Atlantic abyss. The balance, in fact, between the physiological nature of the tilefish and its surroundings is so delicate that catastrophe overtook it within three years of its discovery. The first news of this disaster came in March 1882; throughout that month and the next vessel after vessel reported multitudes of dead tilefish floating on the surface throughout the entire zone inhabited by it north of Delaware Bay, and it has been estimated that at least a billion and a half dead tilefish were sighted.[11]

It has generally been believed that this destruction was caused by a temporary flooding of the bottom along the warm zone by abnormally cold water.[12] Consonant with this is the fact that other species of fish suffered too, and dredgings carried on during the following autumn proved that the peculiar invertebrate fauna that had been found in abundance along this warm zone in previous summers had likewise been exterminated.

The destruction of the tilefish was so nearly complete that fishing trials carried on off southern New England by the Fish Commission later in 1882; in 1883; 1884 (when a particularly careful search was made); 1885; 1886; and 1887 did not yield a single fish. But the species was not quite extinct, as the Grampus proved by catching 8 of them off Marthas Vineyard in 1892, and 53 in 1893. Tilefish were next heard of in 1897 when a fishing schooner caught 30 fish of 6 to 15 pounds, while long-lining for haddock south of Marthas Vineyard. And tilefish had become so numerous again by 1898 that the Grampus caught 363 fish, of ½ to 29 pounds, on three trips of only 1 to 3 days' duration each.

The length of the period which the fish required to reestablish itself after the mortality of 1882, together with the fact that in 1898 the catch included a considerable number of young fish, is evidence that the replenishment of the stock was chiefly the result of local reproduction, though it may have been recruited to some extent by immigration from the southern part of the range, where destruction may not have been so complete as it was north of Delaware Bay.

The tilefish was kept in view during the next 17 years by occasional trips to the grounds by the Bureau's vessels. We caught 19, for example, [page 430] weighing about 350 pounds, on the Grampus on August 26, 1914, in a set of one hour off Marthas Vineyard in 105 fathoms. In 1915, the Bureau undertook to popularize the tilefish in the market, believing it numerous enough to support an important fishery, and knowing it to be an excellent food fish. It proved so plentiful and so easily caught on long lines that the first trip stocked 38,383 pounds in 27 days. And the landings for the first 8 months after the inception of the fishery aggregated upward of 4,388,500 pounds, with a grand total of 11,641,500 pounds from July 1, 1916 to July 1, 1917. But for some reason the demand did not hold up; the catches diminished; and in 1947 (most recent year for which information is available) only 441,000 pounds were landed.[13] the tilefish continues, however, to offer a potential supply of perhaps two to three million pounds yearly, of fish that is good boiled or baked, and that is delicious for chowder. It also makes a good smoked fish, and its sounds are of value for isinglass.

[99] Bull. U. S. Fish Comm., vol. 18, 1899, p. 329.

[1] the shoalest we have known any to be trawled was at 43-47 fathoms, by Albatross III, 35 miles southwest of Nantucket Lightship in mid-May 1950.

[2] Linton, Bull. U. S. Fish Comm., vol. 19, 1901, p. 47; Notes by Vinal Edwards; and our own observations.

[3] the menhaden credited to the diet of the tilefish by Sumner, Osburn, and Cole (Bull. U. S. Bur. Fish., vol. 31, Pt. 2, 1913, p. 767) were merely the pieces of bait on which the fish had been caught.

[4] Collins, Rept. U. S. Comm. Fish. (1882) 1884, p. 244.

[5] Eigemann, Bull. U. S. Bur. Fish., vol. 21, 1902, p. 37.

[6] For details, see Schroeder, Bull. 58, Boston Soc. Nat. Hist., 1931, p. 7.

[7] One of 23 pounds, caught off Key West in more than 100 fathoms, is reported by Al Pflueger, well-known fish taxidermist of Miami.

[8] Taken by the schooner Seminole on February 1, 1946. See Bigelow and Schroeder, Copeia, 1947, pp. 62-63, for details.

[9] Reported by Evermann, Rept. U. S. Comm. Fish. (1903), 1905, p. 85.

[10] Reported to us by J. Webster of the U. S. Bureau of Fisheries.

[11] Collins (Rept. U. S. Comm. Fish. [1882], 1894, pp. 237-294A) has described the event in detail, as have many subsequent authors. An account will also be found in Economic Circular No. 19 of the U. S. Bureau of Fisheries.

[12] No temperatures were taken on the tilefish ground at the season when the mortality occurred; and the bottom water was nearly as warm there by the end of the following August (48°-49°) as it usually is (about 50°-52°). The temperatures taken in this region during the early years of the Bureau of Fisheries are discussed elsewhere (Bigelow, Bull. Mus. Comp. Zool., vol. 59, 1915, pp. 238-241.)

[13] 52,700 pounds in Massachusetts ports; 128,400 pounds in Rhode Island and Connecticut; 186,700 pounds in New York and 53,300 pounds in New Jersey.

Fishes of the Gulf of Maine by Bigelow & Schroeder is the seminal work on North Atlantic fishes. It was originally published in 1925 with William Welsh, a Bureau of Fisheries scientist who often accompanied Henry Bigelow on his research cruises. In the late 1920's, Bigelow began a long association with William C. Schroeder, publishing a number of papers and reports on fishes of the North Atlantic, including the first revision of *Fishes of the Gulf of Maine*. This excerpt is from that 1953 edition.

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