

Cunner

Tautoglabrus adspersus (Walbaum) 1792
[Jordan and Evermann, 1896-1900, p. 1577]

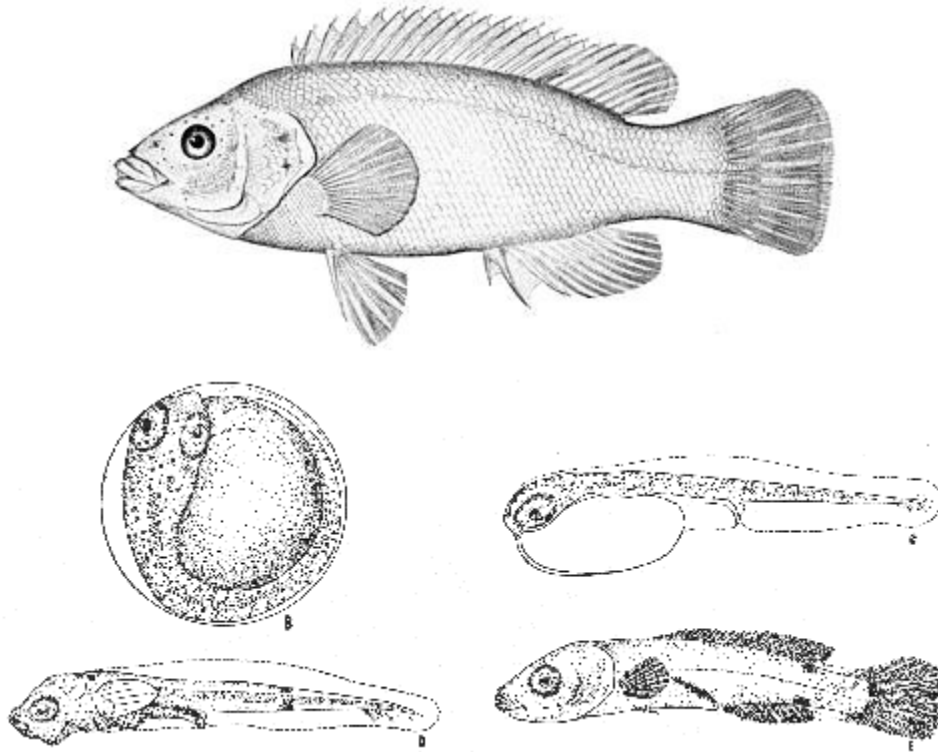


Figure 249 - Cunner (*Tautoglabrus adspersus*)

- A, Adult, Woods Hole, Mass.; From Goode, drawing by H. L. Todd
- B, egg
- C, larva, newly hatched, 2.2 mm
- D, larva, 4.2 mm
- E, young, 8 mm

B-E, after Kuntz and Radcliffe

Description

The readiest field marks by which the cunner may be distinguished from its close relative, the tautog, are mentioned on page 479. It is moderately deep in body, moderately flattened sidewise, with a very deep caudal peduncle, [page 474] flat-topped head (in the tautog the dorsal profile is high arched), small mouth at the tip of the snout, rather pointed nose, and protractile premaxillary bones. Its lips, too, are thinner than those of the tautog. It has several rows of conical teeth of various sizes in each jaw, the outer ones very stout. Its body and gill covers are covered with large scales (in the tautog there is a naked area in front of each gill opening), and its skin is so tough that the fish must be skinned before marketing. Its dorsal fin (about 18 spines and 9 or 10 soft rays) originates over the upper corner of the gill cover, i. e., a little in front of the pectoral fins, and runs back to the caudal peduncle. The first 4 or 5 rays of the dorsal fin are graduated, the others are of about equal lengths.

The soft part is only a little more than one-third as long as the spiny part, and is rounded in outline. The rear margin of the caudal fin is slightly convex with rounded corners. The anal fin (3 stout spines and about 9 rays) originates under or behind the middle of the dorsal and corresponds to the soft part of the latter in outline. The ventrals stand under or a little behind the pectorals; both the ventrals and the pectorals are of moderate size, and the pectorals are rounded.

Color

To describe the color of the cunner is to list all the colors of the bottoms on which it lives, for it is one of the most variable of fishes. As a rule the upper parts range from reddish brown (darker or paler) of a bluish cast to blue with brownish tinge, variously mottled with blue, brown, and reddish. Some fish, however, are uniform brown, while fish caught over mud bottom [page 475] are often very deep sepia. In some situations they may be dull olive green mingled with blue, brown, or rust color. Some cunners are slaty, but reddish or rust tones are apt to prevail when they are living among red seaweeds about rocks. cunners caught in deep water are often almost as red as the rosefish; on the other hand we have seen very pale ones, more or less speckled all over with blackish dots, over sandy bottom. The belly is invariably of a bluish cast, more or less vivid, sometimes whitish, sometimes dusky, sometimes little paler than the sides. Some cunners have the lips and lining of the mouth bright yellow. Young fry are more or less dark-barred and blotched.

Size

In the Gulf of Maine adult cunners, measure about 6 to 10 inches in length and weigh less than half a pound, and one a foot long is very large. But a few are caught up to 15 inches long, and as heavy as 2½ pounds.

Habits

The cunner is chiefly a coastwise fish. In our northern waters they are the most plentiful from just below tide mark downward. They swarm among eel grass (*Zostera*) and about the piling of wharves and under floats in harbors. They also run up into the deeper salt creeks, small fish farther than larger ones, though we have never heard of one in water that is appreciably brackish; and young cunners are often found among eel grass and in rock pools. Southward, however, from New York or thereabouts, most of them keep to water at least 15 to 20 feet deep, hence somewhat farther out, depending on the topography of the coast line and of the bottom.

At the other extreme, they are common enough at 10 to 15 fathoms in the inner parts of Massachusetts Bay, and not rare as deep as 25 to 35 fathoms on the offshore ledges and banks, and we have taken them as deep as 70 fathoms on Georges Bank. But the great majority live within 5 or 6 miles of the shore. And while there are some on the offshore grounds, such as Stellwagen Bank, Jeffreys and Cashes Ledges, and even on Georges and Browns Banks where the otter trawls frequently pick up a few, we have never heard of a large catch of them made far out at sea, whether along southern New England or to the northward. Most of the cunners that are caught the deepest and the farthest offshore are large ones that have probably strayed thither, and finding good feeding, have remained.

As far as we know adult cunners never depart far from the bottom, or from the rocks about which they make their homes, nor do they school. Many, it is true, may live together, but they act quite independently of one another, simply congregating because the surroundings are attractive. Cunners, like other rockfish, spend much of the time resting quietly or swimming slowly among the bunches of Irish moss (*Chondrus*) and fronds of kelp, or in the open spaces among the eel grass (*Zostera*), wherever the latter has reestablished itself, always on the lookout for food.

Cunners are year-round residents, broadly speaking, wherever they are found. At the most, they may descend into slightly deeper water to pass the coldest months, [75] or they may desert the shoalest parts of certain enclosed bays in midsummer to escape the very high temperatures produced there as the sun strikes the flats at low tide. They have been described as hibernating in the mud during the winter, or at least as lying among eel grass or rocks in a more or less torpid state. But we find no positive evidence of this; on the contrary, practical fishermen, among them Capt. L. B. Goodspeed, to whom we are indebted for many notes, inform us that cunners are to be caught in abundance on precisely the same spots in winter as in summer. In fact a few are landed in Boston during the cold months, and the only reason more are not brought in then is that there is so little demand for them.

It has long been known that the cunner is vulnerable to very low temperatures. Hazards of this sort are more frequent south of Cape Cod, where the fish are more likely to be caught in very shoal water in a sudden freeze, than in the Gulf of Maine, where active mixing by the tide usually prevents the water from chilling to the danger point, except at the surface. However, this did take place in Massachusetts Bay in the winter of 1835, when cunners came ashore in quantities between Marblehead and Gloucester. And the failure of the cunners to produce young within the Bay of Fundy (p. 478) suggest that the lower thermal limit to their successful reproduction is about 55°-56°, though the young fry as well as the adults are at home in temperatures close to the freezing point of salt water. The upper [page 476] thermal limit, for the well being of the cunner, is something like 70°-72°, to judge from the distribution of the species.

Cunners are omnivorous. As a rule they find their livelihood browsing among seaweeds, stones, or dock piles, biting off barnacles and small blue mussels, with the fragments of which they are often packed full. They devour enormous numbers of amphipods, shrimps, young lobsters, small crabs, and other small crustaceans of all kinds; also univalve mollusks and the smaller bivalves, hydroids, and annelid worms. They sometimes eat small sea urchins, bryozoans, and ascidians, and they occasionally capture small fish such as silversides, sticklebacks, pipefish, mummichogs, and the fry of larger species. Finally, eel grass is often found in cunner stomachs besides the animal food. Small cunner fry taken at Woods Hole were found by Dr. Linton to have fed chiefly on minute crustacea such as copepods, amphipods, and isopods.

The cunner is a busy scavenger in harbors, congregating about any animal refuse, to feed on the latter as well as on the amphipods and other crustaceans attracted by the same morsels. They are also said to eat fish eggs, and no doubt feed to some extent on herring spawn. Our own belief is that cunners are always hungry, no matter what the stage of the tide.

The cunner spawns chiefly from late spring through early summer. The eggs are buoyant, transparent, 0.75 to 0.85 mm. in diameter, and they do not have an oil globule. Incubation occupies about 40 hours at temperatures of 70° to 72°, but it is probable that about 3 days are required for hatching in the cooler waters of the Gulf of Maine (55° to 65°). At hatching the larvae are about 2 to 2.2 mm. long, and at 15 mm. The young cunner is of practically adult form. On newly hatched larvae the pigment cells are scattered uniformly over head and trunk, but by the 3-mm. stage they have gathered into a pair of black spots, dorsal and ventral, about halfway between the vent and the base of the caudal rays, which are characteristic of the species. And these spots persist to about the 10- to 20-mm. stage. By the time the fry have grown to about 25 mm. They are as variable in color as their parents (it is on record that Louis Agassiz had 60 colored sketches of small cunners 3 to 4 inches long, of different hues, prepared at Nahant during a single summer). [76]

Fry of 1 to 1.2 inches have often been taken in August, and young fish up to 2 inches long in September in southern New England waters. Hence we may assume that Gulf of Maine cunners, (probably hatched somewhat later) may average about 2 to 2½ inches by their first autumn, and 2½ to 2¾ inches by the following June when they are one year old, which Johansen [77] found true also of

the earliest hatched fry in the southern side of the Gulf of St. Lawrence. The subsequent rate of growth has not been studied for the cunners of our Gulf. But Johansen's [78] age determinations for cunners of the Gulf of St. Lawrence make it likely that Gulf of Maine cunners 3 to 4 inches long are 2 years old; those of 4 to 5 inches 2 or 3 years old; those of 5 to 6 inches 3 years old; those of 6 to 7 inches 3 or 4 years old; those of 7 to 8 inches 4 or 5 years old; those of 8 to 9 inches 5 or 6 years old; those of 9 to 10 inches about 6 years old; and those of 10 to 11 inches 6 or 7 years old. But the relationship is complicated by the fact that female cunners run larger than males, so that males may be a year older than females of the same size.

Most of the cunners mature in their third summer (i. e., when 2 full years old) when $2\frac{3}{4}$ to $3\frac{1}{2}$ inches long.

General range

Atlantic coast of North America and the offshore banks, from Conception Bay, east coast of Newfoundland, and the western and southern parts of the Gulf of St. Lawrence, [79] southward in abundance to New Jersey, and occasionally as far as the mouth of Chesapeake Bay.

Occurrence in the Gulf of Maine

The cunner is one of our most familiar fish, to be found all around the shoreline of the Gulf. The Massachusetts Bay region is perhaps their chief center of abundance, and they are so numerous there in [page 477] good years, along the rocky shores and around and over ledges, that no amount of fishing seems to have any effect on their numbers. Generally speaking, they are less numerous east of Casco Bay, and our experience has been that they are progressively less and less so eastward along the shore from Penobscot Bay toward the Bay of Fundy, but average larger. On the outer coast of Mount Desert, for example, it is unusual to catch one in the enclosed harbors (precisely the localities they frequent farther west and south), and most of those caught outside are very large. Thus we took many of 12 to 13 inches, averaging about $1\frac{1}{2}$ pounds, near Baker's Island, off Northeast Harbor, in August 1922, and no small ones. But young fish in plenty, as well as adults, have been reported from Blue Hill Bay, nearby, [80] where the water is warmer in summer.

Cunners are also taken, here and there, along the coast, eastward to the Grand Manan Channel, sometimes in numbers as in 1928, when so many were caught "about the rocks and in the coves to the south of West Quoddy," that they were reported in the press. [81] But they are so scarce ordinarily around Grand Manan and within Passamaquoddy Bay that only half a dozen large specimens had been taken there from the founding of the Biological Station at St. Andrews in 1906 down to the early 1920's. [82] And while the cunner is reported from Black River east of St. John, New Brunswick, it seems to be unknown farther in along the New Brunswick shore of the Bay of Fundy or in Chignecto Bay and Minas Basin at the head. But Annapolis Basin on the Nova Scotian side of the bay, harbors a few, while cunners of all sizes are so numerous in St. Mary Bay that this must be an important centre of reproduction and the source of the few large (i.e., old) ones that are caught farther up the Bay of Fundy. And they are reported along the western shore of Nova Scotia, as at Pubnico for example.

There are large cunners, in small numbers on the offshore fishing grounds in our Gulf also, Stellwagen at the mouth of Massachusetts Bay, Cashes Ledge, and Georges and Browns Banks, as mentioned above (p. 475) in depths down to 50 fathoms or so. But it is not likely that they ever descend into the deep basins of the Gulf. Certainly our experimental trawlings have not yielded any there, 42 fathoms being the greatest depth at which we have known of a cunner taken anywhere in the inner parts of the Gulf. [83]

Extending our survey farther east and north, we find cunners reported as numerous all along the outer coast of Nova Scotia, including the many bays and inlets, also in the southern side of the Gulf of St. Lawrence from Cape Breton to the Gaspé Peninsula, including the shallow bays of Prince Edward Island and the shores of the Magdalen Islands, also up the west coast of Newfoundland as far as Bay of Islands. And they are to be expected at the heads of the bays along the south coast of Newfoundland for they have been taken in Conception Bay on the east coast. But this last is their most northerly known outpost on the Atlantic coast, and they have never been reported either from the estuary of the St. Lawrence or anywhere along the north shore of the Gulf of St. Lawrence. [84]

Cunners near Newport, Rhode Island, commence spawning by mid-May and June sees the chief production of eggs there and near Woods Hole, where most of the fish are spent after the first days of July, though eggs have been taken in abundance there until July 15, a few as late as August 15. [85] Probably spawning does not commence until June in the colder waters of our Gulf, but continues there through the later summer, for our towings have yielded many eggs, apparently of the cunner, in July and August. And the chief spawning season is about the same as this in the southern side of the Gulf of St. Lawrence, according to Johansen [86] and to Reid. [87]

Cunner eggs have been taken at our tow net stations along outer Cape Cod; near Race Point at the tip of the Cape; in Massachusetts Bay (where we have often towed them in great numbers in the tideways between the offlying ledges); and at the mouth of Penobscot Bay, as well as in sundry harbors. Blue Hill Bay inland from Mount Desert may be a breeding center, for small fry are reported there. [88] And eggs taken off [page 478] Libbey Island prove that cunners, spawn in diminishing numbers eastward along the Maine coast nearly to the mouth of the Bay of Fundy. It is doubtful, however, whether eggs produced along the coast east of Mount Desert yield more than a very small proportion of fry, nor do cunners breed successfully in the cold water of the Bay of Fundy, where no small ones are ever seen. However, the Bay is simply a gap in the breeding range, for St. Mary Bay is a productive nursery. Both eggs and larvae were taken at various localities, along the outer coast of Nova Scotia by the Canadian Fisheries Expedition during the summer; and the shoal inshore waters in the southern side of the Gulf of St. Lawrence are a productive spawning area. [89]

Larval cunners and small specimens generally, like their eggs, are so closely confined to the coast line that it is impossible to represent the localities where we have taken them on a general chart of the Gulf; in fact, all our catches of 100 or more have been made either in harbors or at most not a couple of miles from land. [90] there may be some successful reproduction on Cashes and Jeffreys Ledges. But we have found no evidence, whether of eggs or of young fry, that the few large cunners that wander offshore to Georges Bank produce any young there.

Variations in abundance

No evidence is available as to how much the cunners may vary in abundance from year to year, along the coasts of our Gulf as a whole. But they may do so widely at a given locality. Thus we found very few of them in 1950 along the Cohasset shore, on the southern side of Massachusetts Bay, where they are plentiful ordinarily. And they were so scarce there during the summer of 1951, that persons raking Irish Moss (*Chondrus*) reported seeing hardly a cunner around the rocks where many are to be seen in most summers, and another acquaintance who usually baits a lobster pot or two with cunners taken in a cunner trap caught only one occasionally in that way.

Importance

The cunner was a favorite pan fish once. During the 1870's the annual catch of the small boats fishing out of Boston was estimated as not much short of 300,000 pounds, while the fact that 104,100 pounds of cunners were reported for Maine in 1889, 148,300 pounds in 1898, and 281,500 pounds in 1905, shows that the annual harvest was still considerable to that time. But the reported catch had fallen to 30,695 pounds for Maine by 1919, and to about 10,000 pounds for the entire coast line of Massachusetts, south as well as north of Cape Cod. And Maine reported only 10,000 pounds for 1928 and 1,735 pounds for 1929, while the only cunners, reported for Massachusetts were 30 pounds and 45 pounds for those 2 years, respectively. From that time down to 1947, commercial catches of cunners have been reported for Maine in only 3 years out of the 14. [91]

The landings reported for Massachusetts during this period suggests ups and downs so erratic and so extreme [92] that we hesitate to place any dependence upon them further than that landings ranging from 3,100 pounds to 18,700 pounds (average 7,450 pounds) for the years 1944-1947 show that a small demand continues for cunners. And we can witness that sizeable ones are very good pan fish.

Although not regarded as a game fish, the cunner affords amusement to thousands of vacationists near our seaside resorts. And the number caught, of which no record is kept, is so considerable that this must be classed as a useful little fish from the recreational standpoint.

Probably more cunners are caught on bits of clam than on any other bait. But they will take snails broken from their shells, bits of crab, lobster, or pieces of sea worms (*Nereis*) almost as freely. And we have even caught a few while trolling near rocks, for mackerel, with a small spinner tipped with a bit of white fish skin. The little ones are a great nuisance, often stealing the bait as fast as it is offered, and because it is a small-mouthed fish, very small hooks are best.

[75] Ambrose (Proc. and Trans., Nova Scotian Inst. Nat. Sci., vol. 2, No. 2, 1870, p. 93) describes the cunners as moving out of Saint Margaret Bay, Nova Scotia, in autumn, to return early in May.

[76] the embryology and larval development and fry of the cunner have been described by Agassiz (Proc. Amer. Acad. Arts, Sci., N. Ser., vol. 9, 1882, p. 290, pls. 13 to 15); Agassiz and Whitman (Mem. Mus. Comp. Zool., vol. 14, No. 1, Pt. 1, 1885, p. 18, pls. 7-19, and Mem. Mus. Comp. Zool., vol. 40, No. 9, 1915, pls. 32-39); Kuntz and Radcliffe (Bull. U. S. Bur. Fish., vol. 35, 1918, p. 99, figs. 18-29); and more recently by Johansen (Contr. Canad. Biol., N. Ser., vol. 2, No. 17, 1925, pp. 440-450).

[77] Contrib. Canadian Biol., N. Ser., vol. 2, No. 17, 1925, p. 451.

[78] Johansen (Contrib. Canadian Biol., N. Ser., vol. 2, No. 17, 1925, pp. 451-455) worked out the age-length relationship for a large series of Gulf of St. Lawrence cunners by a study of their scales and otoliths.

[79] See Johansen, Contrib. Canadian Biol., Ser. 2, vol. 2, No. 17, 1925, pp. 5-6 [427-428], for the distribution of the cunner in Canadian waters.

[80] Reported to us by Rear Adm. S. E. Morrison, U. S. Navy.

[81] Boston Transcript for August 29, 1928.

[82] Johansen, Contrib. Canadian Biol. N. Ser., vol. 2, No. 17, 1925, p. 5 [427].

[83] One was trawled at this depth at the mouth of Massachusetts Bay (lat. 42° 28' N., long. 70° 13' W.) by the *Albatross II*, July 28, 1931.

[84] See Johansen, Contrib. Canadian Biol., N. Ser. 2, vol. 2, No. 17, 1925, pp. 5-6 [427-428], for an account of the status of the cunner in the Gulf of St. Lawrence, and around Newfoundland.

[85] Agassiz and Whitman, Mem. Mus. Comp. Zool., vol. 14, No. 1, 1885, p. 18, Kuntz and Radcliffe, Bull. U. S. Bur. Fish., vol. 35, 1918, p. 99.

[86] Contrib. Canadian Biol., N. Ser., vol. 2, No. 17, 1925, p. 17 [439].

[87] Contrib. Canadian Biol. and Fish., N. Ser., vol. 4, No. 27, 1929.

[88] By Rear Admiral S. E. Morrison, U. S. N.

[89] See Johansen, Contrib. Canadian Biol., N. Ser., vol. 2, No. 17, 1925, p. 18 [440]; also Reid, Contrib. Canadian Biol. and Fish. N. Ser., vol. 4, No. 27, 1929.

[90] the precise records have been published elsewhere (Bull. Mus. Comp. Zool., vol. 58. 1914, p. 108, and vol. 61, 1917, p. 271).

[91] One hundred and seventy five pounds for 1933, 200 pounds for 1935, 45,300 pounds for 1938, an amount so large that we question its accuracy, especially since the entire catch was reported as made on "lines, trawl." No catch statistics are available for 1934, 1936, 1941, or 1942.

[92] Reported catches for Massachusetts jumped from 45 pounds for 1929 to 349,251 pounds for 1931, dropped to 0 for 1932, 152 pounds for 1933 and 0 again for 1935; rose to 27,800 pounds for 1937; were 0 again in 1933; but 53,500 pounds in 1940.

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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