Longhorn Sculpin

Myoxocephalus octodecimspinosus (Mitchill) 1815 [87]
[Jordan and Evermann, 1896-1900, p. 1976.]

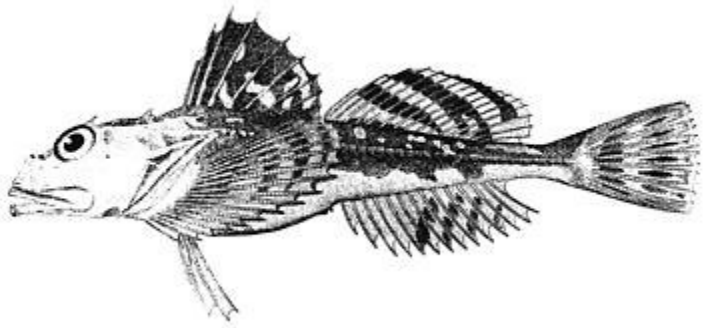

Figure 234 - Longhorn sculpin (*Myoxocephalus octodecimspinosus*),
New Jersey. From Goode. Drawing by H. L. Todd.

Description

This fish resembles the shorthorn sculpin so closely that the description may be, confined to the points in which it differs. Chief of these is the great length of its uppermost cheek spine, which usually is about four times as long as the spine just below, and which reaches at least as far back as the edge of the gill cover. This serves equally to distinguish the young longhorn from the grubby, which is short-horned. All the head spines, too, of the longhorn are so sharp that one must be cautious in grasping one of these fish, for it turns its spines rigidly outward by spreading its gill covers. Furthermore the long spines of the long horn are naked at the tip. The number and arrangement of the head spines [page 450] is the same as in the shorthorn sculpin (p. 445), hence need not be described, and there are two thorns on each shoulder, with a larger one close above the origin of the pectoral fin. The first dorsal fin is higher than the second (in the shorthorn sculpin these two fins are of about equal heights), of rather different shape from that of the shorthorn (compare fig. 234 with fig. 229), and proportionately shorter than in the latter though with about the same number of spines (8 or 9).

The second dorsal fin and the anal have the same number of rays (15 or 16 dorsal and about 14 anal) as in the shorthorn; but the anal of the longhorn originates Under the second or third ray of the second dorsal fin instead of under its fourth or fifth ray. The pectorals are of the fanlike form usual among sculpins. The lateral line of the longhorn sculpin is marked by a series of smooth cartilaginous plates instead of by prickly scales as it is in the shorthorn, a difference obvious to the touch; its body is more slender (about five and one-half times as long as it is deep); and its head is flatter.

Color

The longhorn, like other sculpins, varies in color with its surroundings. The ground tint of the back and sides ranges from dark olive to pale greenish-yellow, greenish-brown, or pale mouse color, but is never red or black as the shorthorn so often is. As a rule it is marked with four irregular, obscure, dark crossbars, but these are often broken up into blotches and they may be indistinct. The coarseness of pattern often corresponds to that of the bottom, as does the degree of contrast between pale and dark. On mud and sand bottom this sculpin is often nearly plain colored, but when it is lying on pebbles with white corallines its back is often nearly white with dark-gray blotches, rendering it almost invisible. The first dorsal fin is pale sooty with pale and dark mottlings or spots; the second dorsal is paler olive with three irregular oblique dark crossbands; the caudal is pale gray; and the pectorals yellowish. Both caudal and pectorals are marked with 4 to 6 rather narrow but distinct dark crossbands. The anal is pale yellowish with dark mottlings; and there often is an obscure yellowish band along the lower part of the sides, marking the transition from the dark upper parts to the pure white belly.

Size

This is a smaller fish than the shorthorn sculpin. It grows to a maximum length of about 18 inches, but only a few of them are more than 10 to 14 inches long. A 10-inch fish weighs about ½ pound, one 12 inches long about 1 pound.

Habits [88]

Everyone who has fished along the shores of our Gulf is more or less familiar with this sculpin, for it is a nuisance to cunner and flounder fishermen. It often is bothersome to the angler to unhook when it spreads its needle-sharp spines and erects its spiny dorsal fin. It grunts when pulled out of the water and bites on any bait.

No doubt it is as omnivorous as the shorthorn. Specimens examined by Vinal Edwards at Woods Hole had fed chiefly on shrimps, crabs, amphipods, hydroids, annelid worms, mussels and sundry other mollusks, squids, ascidians, and on a considerable list of fish fry, including alewives, cunners, eels, mummichogs, herring, mackerel, menhaden, puffers, launce, scup, silversides, smelts, tomcod, silver hake, and small fry of other sculpins. Rock crabs (Cancer irroratus) and amphipod crustaceans (Leptocheirus) had been the dominant food of a large series of shorthorns in Block Island Sound, examined by Morrow; nearly all of them had eaten shrimps (Crago) but in small amount; a few contained small lobsters; and spider crabs (Libinia) were a regular article of diet in winter, but not in summer. It is interesting that these particular shorthorns had eaten only a few mollusks of any kind.[89]

The longhorn is as useful a scavenger as the shorthorn, and equally voracious, gathering about wharves, sardine factories, and under lobster cars, always keeping to the bottom. Its depth range is rather wider than that of the shorthorn. At the one extreme it is abundant in many shoal harbors and bays, where it comes up on the flats at high tide, to leave them at low; and it runs up into estuaries, salt creeks, and river mouths, though never into fresh water, so far as we know. At the other extreme it is caught in considerable numbers down to 50 fathoms or so, and it has been reported as deep as 105 fathoms.[90]

The longhorn evidently is at home in temperatures as high as about 65°-66°, for we have seen many of them in very shallow water that warm, or [page 451] even a little warmer, in summer in the southern side of Massachusetts Bay. But in localities where the temperature of the upper few feet rises much higher than this they withdraw to somewhat deeper (i. e., cooler) water for the summer (p. 452), working inshore again in the autumn.

At the other extreme, it is subjected for the coldest part of the year to water as cold as 32°-33°, both in our Gulf, along the Nova Scotian shelf, and in the Gulf of St. Lawrence, while it has been reported from water of 31°-32° F. (-0.3° C.) in the bottom of Trinity Bay, Newfoundland. And it seems that even exposure to freezing temperature may not be fatal to it, if not too prolonged, for we find no evidence that these sculpins are ever killed by cold when they are overtaken on the flats in severe freezes, a fate that occasionally overtakes cunners and tautog (pp. 475, 480). But the fact that the geographic range of the longhorn does not reach as far north as that of the shorthorn suggests that it is not so well suited as the latter is to very low temperatures continuing throughout the year.

Off the southern New England coast the shorthorn deposits its eggs from late November through January, and perhaps into February, i. e., at the coldest time of the year, with the chief production in late December and January.[91] Presumably the spawning season is the same in the Gulf of Maine. Apparently one locality serves as well as another, nor is there any evidence that any particular depth is sought.

Ripe eggs are about 0.85 mm. in diameter before being laid, but they swell when they come in contact with the water; they are described as varying in color, from coppery green to reddish brown, orange, or purple. A 12¾-inch female, which we examined, taken near Woods Hole on November 18, 1951, contained about 8,000 chocolate brown eggs. They sink and they are so sticky when first laid that they cling together in clumps, or to anything that they may touch; and they continue to adhere during the period of incubation, but the surfaces of the eggs that are exposed to the water lose their stickiness after about 24 hours. The egg masses have been found free on the bottom, in empty clamshells or other cavities, or among the branches of the finger sponge (Chalina) like the eggs of the sea raven (p. 456)[92] and they are sometimes found thrown up on the beach.

The young fry have been taken in February and March off southern New England, in April on the eastern part of Georges Bank and in the channel between the latter and Browns Bank. These young stages[93] have longer cheek spines than the corresponding stages of the shorthorn sculpin (p. 447) they are more slender, and they differ further in the outline of the dorsal fin, for in the longhorns (if our identifications be correct) this is continuous from end to end, only the largest of them showing a shallow notch between spiny and soft portions, whereas in the shorthorn the two sections are separate from the time the fin first takes definite form.

Captures of many young fry 1½ to 2 inches long in September, and 3 to 3½ inches long in February suggest that the longhorn is about 2 to 2½ inches long at one year of age. According to Morrow's studies (based on the otoliths)[94] longhorns off southern New England average about 6½ to 7 inches long at 2 years of age; about 10 inches at 4 years; and 11 to 12 inches at 6 years. They are mature sexually at 3 years or older.

General range

Coastal waters of eastern North America from eastern Newfoundland,[95] and the north shore of the Gulf of St. Lawrence,[96] south regularly to New Jersey, and reported to the Atlantic coast of Virginia.[97]

Occurrence in the Gulf of Maine

This is our commonest sculpin, to be caught anywhere and everywhere along the entire coast line of the Gulf of Maine. We dare venture that there is not a bay, harbor, estuary, or a fishing station from Cape Sable to Cape Cod where it is not to be found. Not only is it more plentiful in most places than its short-horned relative, but it occupies a wider depth zone. It is very abundant in many shoal harbors where it comes up on the flats; it is caught [page 452] also in considerable numbers down to 50 fathoms or so (p. 450). We have trawled it at 27 to 33 fathoms in Massachusetts Bay, and at 50 fathoms off Cape Elizabeth. But it has not been reported from the basin at greater depths.

It also occurs plentifully on Georges Bank, and while the composition of the sculpin population of Georges Bank is yet to be determined, the facts that this was the only sculpin (except the sea raven which it greatly outnumbered) taken there on otter trawling trips in June 1912, or in September 1929, and that the dragger Eugene H took 1,030 of them in 35 trawl hauls on the southwestern part of Georges, at 25-35 fathoms (but none in deeper hauls) in late June 1951, are evidence that it is the commonest member of its tribe on shoal parts of the bank. It is fair, also, to assume that this applies equally to Browns Bank, where fishermen report sculpins of one sort or another as plentiful. It is described, also, as very common along the Nova Scotian coast and banks eastward from Cape Sable, in suitable depths, and as widely but irregularly distributed around the southern shores and islands of the Gulf of St. Lawrence.[98]

The longhorn is a year-round resident, in the sense that its only periodic movements are off and on shore, and of short extent, combined with movements to and from particular grounds. Near New York it is commonest near shore from September to May, and is seen only occasionally in summer. In Long Island Sound they appear to carry out east-west journeys about which little is known; in Block Island Sound (off the mouth of Long Island Sound) they are plentiful on the productive fishing grounds from November through April, but mostly withdraw thence during May (either offshore, or onto more rocky grounds nearby), not to return in force until the next October.[99] these shifts do not appear to be connected with temperature.

All that is known of its movements in the Gulf of Maine is that in partially enclosed and very shallow situations where the water on the flats heats to 68°-70° in the warmest part of the season, but where ice forms in the winter (Duxbury Bay, for example), the shorthorns seek slightly deeper (i. e., cooler) water for the summer, work up again onto the flats in early autumn; move deeper again in late autumn; then work back on the flats again in early spring. They continue common, however, right up to low tide line all summer in localities where the surface does not become so warm in summer or so cold in winter. This is the general rule northward and eastward around the coast of Maine, including the Passamaquoddy region.

The presence of longhorn sculpins of all sizes, from very young fry to adult, proves that they breed all along the coasts of Massachusetts and of Maine, probably along western Nova Scotia as well. But it seems to be restricted as a breeder in the Bay of Fundy to the Scotian side. Thus it appears that the half-grown and adult fish that are plentiful along the New Brunswick shore are migrants, either from the Nova Scotian side across the bay, or from the open Gulf outside.

Importance

The only commercial value this sculpin has had in our Gulf was as bait for lobster pots, for which they were speared formerly in some localities, and caught on hook and line in others. But very few of them are now used in this way.

[87] Placed in the genus Acanthocottus Girard, 1849, by Jordan, Evermann, and Clark (Rept. U. S. Comm. Fish., (1928), Pt. 2, 1930, p. 386).

[88] Morrow (Bull. Bingham Oceanographic Coll., vol. 13, Art. 2, 1951) has recently published a detailed study of this sculpin, as found off southern New England.

[89] For more extensive diet lists see Morrow, Bull. Bingham Oceanographic Coll., vol. 13, Art. 2, 1951, pp. 60-61, 88-89.

[90] In Trinity Bay, east coast of Newfoundland, Rept. Newfoundland Fish. Res. Comm., vol. 1, No. 4, 1932, p. 108, Sta. 35.

[91] For the most detailed study yet made of the breeding habits of the shorthorn, see Morrow, Bull. Bingham Oceanographic Coll., vol. 13, art. 2, 1951, p. 30-36.

[92] Warfel and Merriman (Copeia, 1944, p. 198) were the first to report this interesting habit.

[93] the smallest larva we have seen was 13 mm. long, from Georges Bank.

[94] Bull. Bingham Oceanographic Coll., vol. 13, art. 2, 1951, p. 47, table 6.

[95] Trinity Bay, Newfoundland; Rept. Newfoundland Fishery Research Commission, vol. 1, No. 4, 1932, p. 108, sta. 35.

[96] Repeated characterizations of this sculpin as ranging to "Labrador" are based on Storer's (Boston Jour. Nat. Hist., vol. 6, 1852, p. 250) report of 2 young specimens from some point not specified on the northern shore of the Gulf of St. Lawrence.

[97] Albatross II trawled them in small numbers at 9 stations scattered along the mid-belt of the shelf, from the offing of southern Massachusetts to the offing of Delaware Bay, in the months of February, April, July, and September, at depths ranging from 11 to 50 fathoms.

[98] Cox, Contrib. Canadian Biol. (1918-1920) 1921, p. 111; Leim, Proc. Nova Scotian Inst. Sci., vol. 20, 1940, p. 40.

[99] For further details see Morrow. Bull, Bingham Oceanographic Coll., vol. 13, art. 2, 1951, p. 54.

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.