

Ocean Pout

Macrozoarces americanus (Bloch and Schneider) 1801

[*Jordan and Evermann*, 1896-1900, p. 2457. *Zoarces anguillaris* (Peck) 1904.]



Figure 269 - Ocean Pout (*Macrozoarces americanus*), Eastport, Maine, specimen. From Goode. Drawing by H. L. Todd.

Description

The ocean pout is blenny-like or eel-like in form, its body about 8 times as long as it is deep (10 to 11 times in young fish up to about 8 inches long), moderately flattened sidewise, noticeably sway-bellied, and tapering backward from abreast of the pectorals, where it is deepest, to a pointed tail. It is very soft, its scales are very small, and its skin as slimy as an eel. Its ventral fins are small like those of the rock eel (p. 492), and they are situated well forward of the pectorals.

The most useful field mark for the identification of the ocean pout among the several eel-like fishes with which it might be confused are its vertical fins. Its anal fin is continuous with the caudal, there being no trace of any notch between the two, as is the case with the true eels. In reality, this is also true of the dorsal fin of the eelpout. But about 16 to 24 of the dorsal rays near the rear end of the fin are so short as to be hardly visible, so that there seems to be a considerable free gap between the dorsal fin and the caudal fin. Furthermore, these short rays are spiny instead of soft as all the other dorsal rays are. The dorsal fin runs from the nape back along the whole length of the trunk, and consists of first about 95-100 soft rays; next of the short spines, then of about 17 more soft rays. The anal fin (about 105-124 soft rays) originates a little in front of the mid length of the fish. Both the dorsal fin and the anal are of nearly even height from end to end except as just noted, but the dorsal is nearly twice as high as the anal. The pectoral fins are large and rounded like those of the wolffish. The very small ventrals are on the throat, in front of the pectorals. The upper jaw projects a little beyond the lower, the soft, fleshy upper lip somewhat farther still, [33] enclosing the tip of the lower lip when the mouth is closed.

The mouth is wide, gaping back beyond the small eyes, and it is set low with thick and fleshy lips that give the profile a distinctive aspect. Both jaws are armed with two series of strong, blunt conical teeth, largest in front, but the mouth lacks the crushing teeth that are so characteristic of the wolffish tribe (p. 502). There are 131-144 vertebrae.

Color

Although this fish has usually been described as reddish brown mottled with olive, or as salmon colored, most of those we have seen caught have been of some shade of muddy yellow, paler or darker; some tinged with brownish, some with salmon, and some with orange; a few have been pure olive green. Fishermen usually describe them as yellow, and this is evidently the prevailing hue in the offshore parts of the Gulf. Other ocean pouts we have caught inshore along the coast of Maine, however, have shown yellow only on the margins of the fins, particularly the lower edge of the pectorals, with the general ground tint of sides [page 511] and back ranging from pale gray (sometimes with purplish tinge) to dull brown or to dark dusky olive; the belly ranging from dirty white or yellowish or pinkish to the same dark shade as the back. One of a pair that were caught side by side in Northeast Harbor, Mount Desert, was pale grayish white below while the other was amethyst pink on the belly and on the lower side of the head. Whatever the ground tint, the sides are dotted with small dark spots clustered in irregular crossbars, extending out on the dorsal fin. And there is a dark brown stripe running from eye to edge of gill cover.

Young fry, up to 3 or 4 inches long, are checkered along the sides and irregularly blotched on the back with light and dark brown, and they have a small but prominent black spot on the forward part of the dorsal fin until about 1 foot long, but this spot fades out with growth.

Size

The ocean pout is said to reach a length of 3½ feet and to a weight of 12 pounds; Olsen and Merriman's largest, among some 2,500 specimens, was 38½ inches long, weighing 11¾ pounds, and we have seen one of about 3 feet among the many we have handled. But only a few grow longer than 30 inches, with 16 to 28 inches as a fair average for the general run of those that are caught.

The average weights of pouts of different sizes were about as follows for a large number taken in the southern side of the Gulf of St. Lawrence, in the Bay of Fundy, in the southwestern part of the Gulf of Maine, and off southern New England: 16 inches, ½ pound; 18 inches, 1 - 1-1/8 pounds; 20 inches, 1½ — 1¾ pounds; 22 inches, 2 - 2¼ pounds; 24 inches, 2½ - 3 pounds; 26 inches, 3¼ - 3¾ pounds; 28 inches, 4½ pounds; 30 inches, 5½ pounds. [34]

Remarks

The ocean pout of North Europe (*Zoarces viviparus* Linnaeus 1758), a very close relative, is distinguishable from the American eelpout, by having fewer fin rays (about 100 dorsal rays and 6 to 10 spines; 80 to 89 anal rays), fewer vertebrae (101-126), smaller head and mouth, and only a single row of teeth in the front of the jaw, while some specimens have no interruption between the dorsal fin and the caudal. Also, the European ocean pout is a smaller fish, and its eggs are retained in the ovaries of the mother until after they have hatched, hence its specific name *viviparus* .

It is well known [35] that the European ocean pout tends to break up into genetic races that are partly correlated with environmental conditions. And recent studies by Olsen and Merriman [36] make it likely that there is a slower growing race of ocean pout in the Bay of Fundy and perhaps northward, a larger, faster growing race ranging from Cape Cod southward, with each of these including minor sub-populations. This interesting subject would repay further investigation.

Habits [37]

The ocean pout is a ground fish, as might be expected from the fact that it has no swim-bladder, as well as from its food (see p. 512). And the habits of fish kept in aquaria, where they are described as remaining coiled up in the darkest parts suggests that they spend most of their lives hiding among sea weeds and stones. They are described as moving slowly backward and forward by undulations of the fanlike pectoral fins or of swimming more rapidly by undulating motions of the rear part of the trunk and tail, with the pectorals wide spread and held horizontal, and with the dorsal and anal fins close to the body. [38] they swim actively when disturbed. And it is almost unbelievable to what a hopeless tangle of cord, fish, and slime a few ocean pouts can reduce many fathoms of long line set for other fish.

The vertical range of the ocean pout in one place or another extends at least as deep as 105 fathoms. [39] At the opposite extreme Clemens and Clemens [40] report that young ones are sometimes found around rocks and in seaweed along the shore in the Bay of Fundy during the ebb tide. They are even known to run into rivers for some distance, though always holding to the bottom, i. e., to the undercurrent of water of [page 512] high salinity that tends to move inward along the bottom from offshore. But most of them live between 8-10 fathoms and perhaps 45 fathoms in the waters with which we are most immediately concerned. During the years when ocean pouts were in demand (see below), good catches were made as shoal as 10 to 12 fathoms in the southwestern part of the Gulf, also off southern New England. [41] And we have seen large numbers caught from party boats, at 8-17 fathoms along the coast of New Jersey.

We have taken ocean pouts in the Gulf of Maine on sandy mud, on sticky sand, on broken bottom, also on pebbles and gravel. They are caught in large numbers on smooth hard bottom and we have seen many more of them taken from party boats off northern New Jersey on rocky bottom, along with sea bass (p. 407), tautog, cod, and other fishes, than were taken on soft bottom when we were fishing for hake (*Urophycis*).

There is no evidence that they carry out any extensive migrations. However, information has accumulated recently to the effect that the adults congregate through the summer, autumn, and early winter on rocky bottoms where the eggs are deposited and guarded, to disperse again in midwinter (after the eggs have hatched), over the smoother grounds in the vicinity where food is more plentiful. [42] And this spawning migration appears to be complicated by an autumnal shift offshore to deeper water, with a return movement in spring, in coastal regions where the bottom water chills in winter to a temperature too low for their comfort; in the Bay of Fundy, for example (p. 514), and perhaps in the Gulf of St. Lawrence.

The ocean pout can be classed as a cool-water fish, for the great majority of them, in whatever part of their geographic range, are in temperatures at least no higher than about 62°, throughout the year. At the other extreme, they have been taken in 32° in the Bay of Fundy (p. 514); in about 31° to 32° in Trinity and Conception Bays, Newfoundland. [43] And eelpouts are exposed to temperatures as low as this, in spring, in the Gulf of St. Lawrence, unless they descend deeper into the Laurentian Channel, which they may do.

Food

The American ocean pout feeds on a wide variety of shelled mollusks, univalve and bivalve, on crustaceans large and small, on echinoderms and on other invertebrates. The Bay of Fundy fish opened by Clemens and Clemens had dieted chiefly on the two common mussels, *Mytilus* and *Modiolaria*, on whelks (*Buccinum*), periwinkles (*Littorina*), and on scallops (*Pecten*) as well as on various other bottom-living mollusks, on sea urchins, brittle stars, and barnacles. A large specimen caught in Massachusetts Bay, January 1924, was packed full of brittle stars (ophiurans), spider crabs, and small sea scallops (*Pecten magellanicus*); a number trawled by the *Albatross III* at 42 fathoms, near Nantucket Lightship, May 17, 1950, were full of small sea scallops (*Pecten magellanicus*), as many as 100-200 per fish. Olsen and Merriman [44] write that sand dollars (*Echinarachnius*) were the chief items in the stomach contents of some 850 ocean pouts taken in the southwestern part of our Gulf and off southern New England, with crabs (*Cancer*) and isopod crustaceans (*Unicola*) as seconds; while some had eaten bivalve mollusks (*Yoldia* and *Pecten*) in large amounts; also the eggs of the longhorn sculpin (p. 451), which are often laid among the branches of the finger sponge (*Chalina*).

Ocean pouts bite on fish as greedily as they do on clams or cockles, and pouts kept in the aquarium at St. Andrews took fish as readily as clams; [45] while two of the fish opened by Clemens and Clemens, [46] and also Bay of Fundy fish examined by Olsen and Merriman, [47] contained remains of fish. But in all probability about the only fish they get are dead ones that have sunk to the bottom, or occasionally a small one that a pout may have the good luck to catch. The European representative of our ocean pout (*Zoarces viviparus*) is described [48] as taking in mouthfuls of weeds for the crustaceans and mollusks living among these, and as swallowing a considerable amount of the plant material with its animal prey. But American ocean pouts appear not to feed in [page 513] this way to any great extent, for only traces of plants have been found in their stomachs.

The eggs of the European ocean pout (*Zoarces viviparus*) are fertilized within the mother, and are retained within her oviducts until after they hatch. But the American eelpout lays eggs, as proved by the fact that the young were hatched from a mass of eggs brought up, with two eelpouts, in an old rubber boot, [49] in Blacks Harbor, Passamaquoddy Bay. And enough small specimens of 1-1/3 inches and upward have been collected of late, between New Jersey and Maine, to show that the eelpout breeds successfully throughout this part of its range, at least; and probably as far north as northern Nova Scotia and the southern side of the Gulf of St. Lawrence.

Various lines of evidence [50] show that spawning takes place in September and October. And the fact that fish taken in summer differ widely in the stage of development of their sexual products suggested to Clemens and Clemens that they do not breed every year. But it seems more probable to us that this is evidence simply of a protracted breeding period, some individuals ripening early in autumn, others not until later.

Large females lay more eggs than small, the numbers of maturing eggs actually counted having ranged from 1,306 in a fish 21½ inches (55 cm.) long to 4,161 in one of about 34½ inches (87.5 cm.).

The eggs are yellow, 6-7 mm. in diameter, and are laid in masses held together by a gelatinous substance. The only egg mass so far brought in was in an old rubber boot, suggesting that they are normally deposited in crevices in rocks or among stones, which would explain the apparent tendency of the mature fish to congregate on rocky bottom as the spawning season approaches.

The fact that eggs brought up in the trawl in the Passamaquoddy region, where the spawning is supposed to take place from mid-September through October, hatched in early January, and that oceanpout eggs taken off New York in mid-November [51] still were some weeks short of hatching, makes it likely that incubation occupies at least 2½ to 3 months. And the actions of a captive female that lay coiled around its mass of eggs, though these had not been fertilized, [52] makes it likely that the eggs are guarded by one or the other parent during this period, perhaps by both of them.

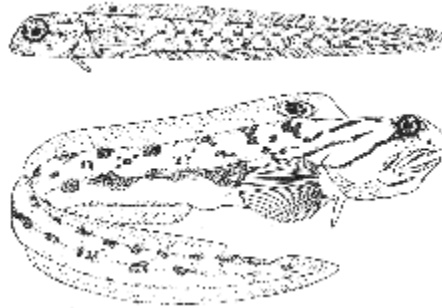


Figure 270 - Ocean pout (*Macrozoarces americanus*).
Above, larva, 48 mm. Below, young fish, 387 mm.
Drawings by Louella E. Cable.

The larvae are about 30 mm. long at hatching, i. e., much larger than those of most of our commercially important fishes, and they are so far advanced already in development that they are easily identified. [53] Being so nearly adult in form, it is probable that they hold to the bottom from the time they are hatched; all catches of immature fish recorded so far have, indeed, been on the bottom.

The sizes, of the fry in different months, show that ocean pouts reach a length of about 3 inches during their first summer, and that they are about 4 to 5 inches long when 1 year old. According to studies of otoliths by Olsen and Merriman, [54] ocean pouts in southern New England waters may be expected to reach 6 inches when between 1 and 2 years old; 12 inches at 3 years; and 24 inches when between 6 and 7 years, the very large fish of 36 inches and upward being 12 years to 16 years old. Estimates by the same method by Clemens and Clemens [55] point, however, to a considerably slower rate of growth in the colder water of the Bay of Fundy, where a 12-inch fish is likely to be nearly 5 years old, a 24-inch fish between 12 and 13 years old; and where the 8 oldest fish examined [page 514] (16-18 years) among 190 specimens, were only 26¾ to 28½ inches long.

In one commercial catch, probably representative, made off Provincetown and analyzed by Olsen and Merriman, most of the fish were 4 to 10 years old, with only scattered fish of 11 to 16 years.

Off southern New England, according to Olsen and Merriman, a few females mature sexually when they are about 18 inches long; about half at 22-23 inches, and all of them by the time they are 24-25 inches long; males mature earlier, most of them by the time they have reached 15-16 inches; a few not until larger. The smallest females with large eggs seen in the Bay of Fundy region by Clemens and Clemens were 16-18 inches long.

General range

Coast of North America from the Strait of Belle Isle, Gulf of St. Lawrence, and southeastern Newfoundland south to Delaware; [56] common from the southern side of the Gulf of St. Lawrence and northern Nova Scotia to New Jersey.

Occurrence in the Gulf of Maine

The ocean pout, known more familiarly as "conger", or "congo" eel along the coast of Maine, [57] is a familiar fish in the Gulf in moderate depths of water both near shore and on the offshore banks; abundant locally off western Nova Scotia; in the Bay of Fundy; [58] all along the coasts of Maine and Massachusetts; and on Georges Bank where considerable numbers are taken both by otter trawlers and by long-line fishermen. [58] Very small ones have been collected off Chatham, Cape Cod; on Stellwagen Bank at the mouth of Massachusetts Bay; and near Mount Desert Island, Maine, by us; also in the Bay of Fundy and in Passamaquoddy Bay by Clemens and Clemens, [59] evidence that it breeds successfully all around the Gulf.

There seems to be a wide difference in the depth zone frequented by the ocean pout in different parts of the Gulf. In the Bay of Fundy some of them run up into shoal water in summer and young ones are to be found under stones and among seaweed between tide marks. Similarly, one is always apt to catch several in a half day's flounder fishing in 1 to 3 fathoms in Penobscot Bay or in Northeast Harbor, Maine, as we can bear witness. And this probably applies to bays and harbors all along the coast of Maine east of Cape Elizabeth. But we have never seen one taken in less than 10 fathoms of water in the Massachusetts Bay region, where most fishermen speak of it as a comparatively deep-water fish though it has been recorded from Gloucester Harbor. And the ocean pouts on the offshore grounds live mostly deeper than 20 to 30 fathoms. Thus *Albatross II* trawled a number in the basin of the Gulf down to 90 fathoms in July 1931, while a large number of them have been trawled on Georges Bank, at depths of 20-60 fathoms. [60] And in May 1950, the *Albatross III* trawled 3 at 105 fathoms or deeper [61] on the southwestern slope of Georges Bank.

Ocean pouts also frequent different types of bottom in different localities. In Massachusetts Bay they are seldom caught on the good fishing grounds on stony or gravelly bottoms, that is, or about ledges. But if the long line chances to run off these, the portion of it that is resting on the softer floor of the deeper parts of the bay often brings in eelpouts and nothing else except an odd hake. They are caught regularly on hard bottom, however, off Cape Cod and to the westward; we have trawled them on rather sticky sand in Ipswich Bay (22 fathoms) among good catches of hake and plaice; on broken bottom at the mouth of Casco Bay; on pebbles and mud in Penobscot Bay; they are commonly caught on stony ground farther eastward along the coast of Maine; and Huntsman describes them as taken on hard bottom in the Bay of Fundy.

In fact, the only type of bottom where we have not heard of them in our Gulf is the soft oozy mud with high organic content that floors certain of the deeper depressions, such as the trough to the west of Jeffreys Ledge. [62]

Information as to the seasonal movements of ocean pouts in different parts of the Gulf is not only scanty, but perplexing. In the open Bay of Fundy, Huntsman describes them as working inshore in spring but moving out again into deeper water in [page 515] October or early November, which is corroborated by a report of Clemens and Clemens, that set lines made good catches in the Passamaquoddy region from early June through September, but caught none there from January to May. And their abundance in Penobscot Bay in midsummer suggests that some of them may perform a similar on and offshore migration there, too. But this may not apply to the coast south of Cape Elizabeth. Off southern New England, where they are plentiful on the commercial fishing grounds in winter and spring, only stray ocean pouts are taken there in summer and autumn. But it seems more likely that they shift, then, to regions of rockier bottom nearby, than that they move off-shore. [63]

It is not yet clear to what extent their movements depend on the local food supply, on seasonal changes in temperature, or on the habit the mature fish have of congregating on rocky grounds during the spawning season, and while guarding the eggs thereafter (p. 513). One must also bear in mind that failure to catch them on hook and line may simply mean that they are not biting at the time, not necessarily that they have moved away. This is likely to apply to the adult fish in particular during their spawning and egg-guarding season.

Importance

Although the ocean pout has few bones and is said to be a sweet-meated fish, there was no regular market for it prior to the early 1930's; only a few, brought in by small boats, were sold on the streets of Boston, and nearly all of those that were caught incidentally by the larger vessels were thrown overboard. A small demand then developed for them resulting in landings for Massachusetts ranging between 45,600 pounds and 114,700 pounds yearly, for the period 1935 to 1942, [64] though none for Maine.

A concerted attempt was made in 1943 to market ocean pout as fillets, partly as a war measure. This was so successful that 3,943,300 pounds were reported as landed in Massachusetts ports in that year; 4,449,600 pounds in 1944, most of them caught from the tip of Cape Cod southward, and nearly all of them marketed through New York. But this popularity was short lived, for word soon spread that ocean pout are often afflicted with a protozoan parasite. Many shipments were condemned for this cause, and the demand fell off so rapidly that the landings for Massachusetts were less than one-fourth as great in 1945 (1,003,700 pounds) as they had been in 1944 [65] ; fell to 613,300 pounds in 1946; were 167,400 pounds in 1947; and dropped to 6,100 pounds in 1948, the most recent year for which statistics of the catch are available.

[33] the ocean pout has sometimes been described and pictured as with the upper lip and jaw projecting far beyond the lower; but this is contrary to our observations.

[34] According to graphs by Clemens and Clemens (*Contrib. Canadian Biol.* (1918-1920) 1921, fig. 5, p. 79), for the Gulf of St. Lawrence and Bay of Fundy; and by Olsen and Merriman (*Bull. Bingham Oceanographic Coll.*, vol. 9, art. 4, 1946, fig. 4, p. 43) for the southwestern part of the Gulf of Maine and for southern New England.

[35] Especially from investigations by Johannes Schmidt and by J. V. C. Smith (for list of references, see Olsen and Merriman, *Bull. Bingham Oceanographic Collection*, vol. 9, art. 4, 1946, p. 182).

[36] *Bulletin, Bingham Oceanographic Coll.*, vol. 9, art. 4, 1946, p. 116-117.

- [37] Olson and Merriman (Bull. Bingham Oceanogr. Coll., vol. 9, art. 4, 1946) have recently published a detailed study of the life history of the ocean pout.
- [38] Willey and Huntsman (Canadian Field Naturalist, vol. 35, 1921, p. 6). and Clemens and Clemens (Contrib. Canadian Biol. [1918-1920], 1921, p. 71) give some observations on the actions of ocean pouts kept in the aquarium at the St. Andrews Laboratory.
- [39] *Albatross III* trawled 3 specimens from between 105 and 240 fathoms, on the southwestern slope of Georges Bank in May 1950.
- [40] Contrib. Canadian Biol. (1918-1920) 1921, p. 72.
- [41] Olsen and Merriman, Bull. Bingham Oceanographic Coll., vol. 9, art. 4, 1946, p. 37, 38, fig. 3.
- [42] This shift of grounds has been demonstrated recently by Olsen and Merriman (Bull. Bingham Oceanogr. Coll., vol. 9, art. 4, 1949, p. 40-42).
- [43] Rept. Newfoundland Fish. Res. Comm., vol. 1, No. 4, 1932, p. 109.
- [44] See Olsen and Merriman, (Bull. Bingham Oceanog. Coll., vol. 9, art. 4, 1946, p. 124-129) for a list of stomach contents, with discussion.
- [45] As reported by Willey and Huntsman, Canadian Field Naturalist, vol. 35, 1921, pp. 6-7.
- [46] Contrib. Canadian Biol. (1918-1920) 1921, p. 80, small fish, including a smelt.
- [47] Bull. Bingham Oceanogr. Coll., vol. 9, art. 4, 1946, p. 129; probably herring.
- [48] By Blegvad, Report Danish Biol. Stat. (1916), 1917, p. 42.
- [49] For account, see White, Jour. Fish. Res. Bd. Canada, vol. 4, pt. 5, 1939, pp. 337-338.
- [50] Discussed in detail by Olsen and Merriman, Bull. Bingham Oceanogr. Coll., vol. 9, art. 4, 1946, pp. 69-77.
- [51] From the stomach of a cod, see Olsen and Merriman, Bull. Bingham, Oceanog. Coll., vol. 9, art. 4, 1946, p. 76, fig. 9.
- [52] See Olsen and Merriman (Bull. Bingham Oceanog. Coll., vol. 9, art. 4, 1946, p. 75, fig. 8) for a photograph of a female so employed, in the Shedd Aquarium, Chicago.
- [53] For further details, see White, Jour. Res. Board Canada, vol. 4, 1939, p. 338.
- [54] Bull. Bingham Oceanogr. Coll., vol. 9, art. 4, 1946, pp. 85-93.
- [55] Contributions to Canadian Biology, 1918-1920 (1921), p. 74.
- [56] there is a doubtful record for North Carolina (Smith, North Carolina Geological and Economic Survey, vol. 2, 1907, p. 379).

[57] Years ago we heard them called "yowlers" by long-line fishermen, but we doubt that this name is still used for them anywhere.

[58] Clemens and Clemens (Contrib. Canadian Biol. (1918-1920) 1921, p. 69) give a general account of the ocean pout in the Bay of Fundy, and list the localities there whence it has been recorded.

[59] Contrib. Canadian Biol. (1918-1920), 1921, p. 77.

[60] *Albatross III*, for example, trawled 137 of them along the southern slope of Georges, at 31-60 fathoms, in May 1950; the dragger *Eugene H* trawled an average of 8 pouts per haul at 26-45 fathoms, and about 2 per haul at 46-75 fathoms on the south central part of Georges Bank, in late June 1951.

[61] the depth ranged from 105 fathoms to 240 fathoms along the strip of bottom on which the trawl was working.

[62] they were not represented among the considerable list of fishes trawled in such situations by the *Atlantis* in August 1936 (Bigelow and Schroeder, Biol. Bulletin, vol. 76, 1939, p. 309.)

[63] For discussion, see Olsen and Merriman, Bull. Bingham Oceanogr. Coll. vol. 9, art. 4, 1946, pp. 40-42.

[64] Landings for 1933 to 1940 were listed as "conger eels"; no data are available for 1934 or 1936.

[65] For a detailed history of the event, see Olson and Merriman, Bull. Bingham Oceanogr. Coll., vol. 9, art. 4, 1946, pp. 9-10.

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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