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On the Occurrence of the Pollack (*Gadus pollachius*) in Southern Baltic in 1963

by

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The pollack has been known as a sparse but regular immigrant visitor into the southern Baltic at least from the time (in the 1920's) when the trawl fishery began there. As a rule only occasional specimens have been recorded in the cod catches, usually during the winter months and spring, but sometimes in summer, too. North of the Hanö Bay and of the latitude 56°N the pollack was caught twice in 1958 for the first time by Swedish fishermen: one fish between Västervik and the north point of the island of Öland in February and another about 6 naut. miles east of När lighthouse on Gotland (central Baltic), probably in the cold season. It was at that time quite unknown to the fishermen in these northern waters. In January-February 1961 and in the winter of 1961-62 some further specimens were caught between Västervik and Öland. The principal regions for its occurrence have been the Arkona Basin and the waters north, east and south-east of Bornholm to about longitude 17°E . The pollack is, of course, more frequently noted in the western part of the Arkona Basin than in the eastern areas. - The specimens caught have frequently been large ones, about 50 cm of length or larger. According to the fishermen some younger fish (length 30-40 cm) were noted in the Västervik - Öland area in 1961-62.

The invasion of 1963

During 1963, however, a small invasion of the pollack was observed in the southern parts of the Baltic - it occurred in greater numbers than ever before. From 19 to 31 January about 550 kg fish were landed at Trelleborg and 300 to 400 kg at Ystad. The greatest catch per day was at Trelleborg 201 kg on 28 January. The fish were caught with trawl in connection with cod fishing south-east of Trelleborg and south of Ystad, 10 - 25 naut. miles from the coast (depth 40 - 48 m). About 1500 kg were landed at Simrishamn in the period 27 January to 6 February from the same region, later single specimens, chiefly in February. The greatest catch landed in one day

was 410 kg on 28 January.

In the Hanö Bay, to the east and south-east of Simrishamn, only small catches were made from the end of January to the beginning of March. The research vessel Skagerak for instance caught nine specimens (length 58 - 75 cm) with trawl, about 15 naut. miles south-east by east of Simrishamn, on 28 - 29 January at a depth of 70 - 75 m. On 5 March a fishing boat took about 300 kg pollack and 5 - 6 tons large cod in one haul about 18 naut. miles E-N of Simrishamn (depth 65-70 m). Another boat got 130 kg pollack and 5450 kg large cod in one haul at the same time. The next day the first boat caught about 200 kg pollack. Most of the boats fishing in that region caught no pollack at all, or only single fish. A few of the subsequent days some single specimens were noted, and after that none at all in this locality. Some few fish were landed among the cod catches at Simrishamn as late as May (probably from fishing grounds farther east), and some isolated records were reported even as late as August. - Single specimens were caught about 15 - 40 naut. miles SSE and SE Utklippan (depth 60 - 70 m) and landed at Karlskrona from the beginning of February to and including March (one as early as 23 January).

Nearly all the catches mentioned above were of large specimens, weighing 2 to 5 kg. It was reported from the waters off Utklippan that the specimens caught were larger than the finds made during former years. In the same region, one specimen was caught SE Öland at a depth of about 60 m on 11 February (length 49.5 cm). Some smaller pollack (length 20 - 35 cm) were exceptionally noted among the large ones in the waters south-east of Trelleborg only (according to the fishermen).

Large catches were made still later in the waters E and SE of Bornholm. On 28 March, a Swedish boat caught 360 kg pollack (weight 2 to 5 kg each), besides 3.4 tons of cod in one haul. The catch was made about 16 naut. miles ESE Nexö (at a depth of about 78 m). In the following hauls not a single pollack and only a moderate amount of cod was caught at the same place. The catch was landed at Karlskrona, where a total of about 450 kg pollack was landed between 23 January and 28 March. On Bornholm, too, the landings of pollack increased. The first large catch was landed at Nexö on 1 April, 134 kg (only single specimens were caught between 24 January and 6 March). Later, small catches were landed, the last on 4 May. Only on 26 April was a larger quantity, 306 kg, noted. According to reports from Fiskernes Salgsforening at Nexö, the largest catches were made about 15 naut. miles SE Nexö (depth 70 - 75 m). A total of 640 kg was landed at Nexö. From the important fish-harbour of Rönne, too, an unusually high pollack frequency was reported during the winter of 1963, but since the species was not at all sold separately from cod, no data on the quantities are available. The figures given above are all minimum quantities - small catches and single specimens of pollack

have not been kept separate from the catches of cod. Possibly some occasional specimens of coalfish (Gadus virens), a species much rarer as an immigrant in the Baltic than the pollack, may have been reported as pollack. Sometimes the fishermen (especially on Bornholm) do not distinguish between the former species and the pollack, calling both coalfish ("sej"). - No records were noted in central Baltic during the period in question.

At a low estimate, according to the above account, a total of about 5 tons of pollack (weight cleaned) was landed at Swedish and Danish harbours alone in the Baltic from the end of January to the beginning of May 1963. Further quantities may have been landed in other countries. The catches were generally of large specimens weighing from 2 to 5 kg, and the largest catches were made when shoals of pollack appeared together with shoals of old, large cod. The chronological pattern of the culmination of the catches in different areas indicates a migration route Arkona Basin - Hanö Bay - the waters SE of Bornholm. The less saline water may have stopped further penetration eastwards. It may be that the pollack were accompanying shoals of cod on their way eastwards. The cod fishery was extremely good off the south coast of Skåne in January, among the richest ever performed there.

The hydrographical situation

Immigrations of fish from the west into the Baltic may often be connected with the influx of saline water via the Kattegatt and the Belts. An example of this was an occurrence of i.a. haddock (Gadus aeglefinus), Norway pout (G. esmarki) and poor cod (G. minutus) in the Bornholm region during the winter of 1959-60. In 1963 we were fortunate in being able to make hydrographic studies with the research vessel Skagerak in the Arkona Basin and east of Bornholm, both before and during the "invasion catches" of the pollack (8 - 9 and 23 - 28 January). The changes in the salinity of the deeper layers of water in the Arkona Basin were insignificant, however. At the hydrographical station S 12 in the central part of the area (55°00'N, 14°05'E) the salinity values were as follows (‰):

	depth (m)						
date	0	10	20	30	40	45	48
8.I	8.19	8.19	8.24	8.24	-	13.22	-
25.I	8.12	8.23	8.40	8.58	8.77	12.88	15.44

In the Bornholm Deep the small changes in salinity were in a wholly negative direction - towards lower values. (Nor were any signs of a considerable influx observed in samples taken in March, April and May.)

Owing to the great amount of ice, the lightships Gedser Rev and Fehmarnbelt were taken in, and no observations could be made from them later than 11 and 12 January respectively. A restricted influx of salter water was noted at these lightships in

December - maximum salinity at Fehmarnbelt (depth 25 m) 22.03 ‰ on 13.XII and at Gedser Rev (20 m) 17.2 ‰ on 11.XII. After that mainly low salinity was recorded.

It seems most likely, therefore, that the invasion of pollack was caused by conditions in the Kattegatt and adjacent waters. Unfortunately, the lightships there, too, were mostly in harbour on account of ice. A very marked change in the hydrographical situation off the west coast of Sweden was recorded at the Bornö station (depth 33 m) in the Gullmarsfjord in the middle of January, however. After a northerly half-gale on 14 January, a salinity of 34 ‰ and higher occurred for a long period at depths less than 25 m - a rare phenomenon. On 21 January, at a depth of 5 m, a salinity of 34.15 ‰ was recorded, the next day 34.25 ‰, and on 24 January 34.55 ‰, while temperatures generally exceeding + 7° C were recorded at this depth from and including 16 January (ice on the surface). On 16 January the temperature at 2.5 m was -0.40° C (S = 26.35), on 17 January it had risen to +5.00° C, and continued to rise to 7.04° C on 24 January (under the ice !).

This warm, highly saline water led to a breaking up of the ice in the outer archipelago outside the Gullmarsfjord and along the west coast, as far southwards as the neighbourhood of Göteborg at least, around 19 - 20 January. It is probable that the less saline water of the Baltic current was forced in some way towards the west outside the west coast of Sweden, at the same time as water from the North Sea flowed close to the shore. It may be that low salinity water was led into the western Kattegatt to a larger extent than usual, preventing North Sea water from penetrating farther to the south-west. This is in the present preliminary report a hypothesis which requires further study - there may be more hydrographical observations from the region. (A more comprehensive account of the connection between hydrography and fish immigrants into the Baltic in recent years is in preparation).

Conclusions

The invasion into the Baltic may thus be explained as an error in orientation by the pollack on account of prevailing hydrographical conditions in the Kattegatt and Belt Sea, possibly in connection with an immigration into these waters from the north and north-west. Evidence in favour of this explanation is the fact that no remarkable influx of saltier water into the Arkona Basin was observed at the time in question, and the circumstance that the stock of fish in the waters around Bornholm, according to our investigations during the period November 1962 to May 1963, gave a strong "Baltic" impression, with very few finds of other western species - even the whiting was generally rare. This is also in agreement with observations

made by Swedish fishermen. In the period of current interest they have reported some very isolated records only, e.g. of coalfish, ling (Molva molva), and the picked dogfish (Squalus acanthias).

The chances of catching young pollack are clearly much smaller in the Baltic than are those of catching older specimens. It is no doubt in connection with spawning migration that sensitivity to brackish water is most easily overcome. Furthermore the younger pollack are less pelagic as to their habits than the mature ones. The habitat of the young (length usually observed 20 - 40 cm) is mainly the water close to the hard bottoms. In the warm half of the year they are to be found even in shallow water (depth 2 - 3 m) among the skerries off the west coast of Sweden. In the Kattegatt, pollack are caught with trawl, especially during late winter and spring. The catches of the old fish is fairly irregular. From the research vessel Skagerak we once obtained about 700 kg large pollack (weighing 4 - 6 kg each, almost in spawning stage) in one haul, on 7 March 1951 about eight naut. miles SW Falkenberg. Most usually, however, fish of about 1 - 2 kg and in smaller quantities are caught in the Kattegatt southwards down into the Sound.

Generally speaking the occurrence of the pollack in 1963 underlines the fact that the relation between the appearance in the Baltic of fish immigrants from the west and the influx of saline water is no simple one. The ability of active migration has the consequence that the records of an immigrant visitor can show a wide dispersal in the Baltic, e.g. those of the picked dogfish and of the mackerel (Scomber scombrus). In the present case of the pollack its shoaling behaviour and some association with cod shoals may possibly have checked or at least delayed the further spread. - Single records of the pollack are known already from the nineteenth century in southern Baltic. Following the great changes as to fishing methods it is not possible to judge from the Swedish fishery if there has been any change or if there is any present trend in the occurrence of the pollack in the Baltic.

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