International Council for the
Exploration of the Sea

C.M. 1963
Baltic-Belt Seas Committee
No. 73

Distribution of the crab, Rhithropanopeus harrisii (Gould) subsp. tridentatus (Maitland), in Poland

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A rapid growth of the population of the crab, Rhithropanopeus, in the Ijsselmeer in Holland was observed in the years 1933-36. During that period the species seemed to penetrate new areas in Europe (Holthuis, 1954). Rhithropanopeus, for many years known under various names (Pilumnus tridentatus, Heteropanope tridentata), was at first regarded as an endemic form related to the Dutch territory (Buitendijk and Holthuis, 1949). At present the crab inhabits many coastal waters in Europe, its distribution being, however, discontinuous. Rhithropanopeus is a brackish water species but can also live in nearly fresh and fresh water (Mordukhay-Boltovskoy, 1952; Holthuis, 1954; Kujawa, 1957; Zmudziński, 1957).

The first reports on this species occurring outside Holland came from Germany (Schubert, 1936), and from the Russian part of the Black Sea (Makarov, 1939). In post-war years it was observed to spread along the Black Sea coast as far as the Sea of Azov (Mordukhay-Boltovskoy, 1952) and, as Holthuis reported (1954), in Bulgaria and Rhumania and was reported to have entered also the Caspian Sea (Nebolsina, 1959). Spreading westwards, the species got as far as France, reaching the area of Caen (Saudray, quoted after Riffon, 1956) and also occurred in the Gironde (Tiffon, 1956).

In the inshore area of the Baltic the crab was found in Copenhagen harbour (Tiffon, 1956), in Poland and in the U.S.S.R. In 1951 Demel (1953) found it in the Polish, and Murina (Birstein, 1952), in the Russian parts of the Firth of Vistula. Apart from this, Michalski (1957) reported on the occurrence of this species in 1953 in the Vistula River near Gdańsk harbour.

The observations carried out by the Biological Station at Górki Wschodnie, Poland (Pautsch, 1957) reveal that since 1955 the crab has abundantly spread throughout the river Martwa Wisla (Dead Vistula). This portion of the Vistula contains stagnant water whose salinity is being greatly influenced by the sea. In the areas populated by Rhithropanopeus the salinity varies between 3-5 ‰, its annual fluctuations (as measured at some points) being slight, with a maximum of 2 ‰. In areas where the population of Rhithropanopeus is most abundant, the salinity is about 4-5 ‰. The varying salinity noted along the course of the Dead Vistula appears to be the natural selective factor controlling the abundance of this species. Hence, in areas where the inflow of fresh water is great the number of the crabs is smaller. Large numbers of individuals were caught, using a trawl, at a slimy bottom poor in plants and with much organic matter, whereas the larvae were caught in areas where the river bottom was covered with plants. Sexual reproduction takes place during the summer months, June - August, being particularly intense in July (Lawinski, Weglarska, 1959). A similar reproductive period has been reported by Mordukhay-Boltovskoy (1952) for the population inhabiting the inshore area of the Sea of Azov. In respect of their cephalothorax length and other characters, individuals from the Dead Vistula do not differ from the remaining European populations of Rhithropanopeus.

Hydrobiological studies carried out in the two Baltic firths within the Polish borders did not bring any evidence to prove the invasion of the Firth of Szczecin by the crab, Rhithropanopeus (J. and K. Wiktorowie, 1959). Although one might think that the sailing of many ships in this area would favour the penetration of the Firth of Szczecin by Rhithropanopeus, the hydrobiological studies carried out in this region failed to provide any evidence that would indicate this. The above can perhaps be accounted for by the hydrographical and hydrobiological features of the Firth of Szczecin, where great annual fluctuations in salinity (0.2 - 2.7 ‰) and a considerable influence of the fresh water flowing from rivers are observed (J. and K. Wiktorowie, 1959).

It is rather difficult to decide whether the crab penetrated the Dead Vistula after having invaded the Firth of Vistula or vice versa. A regular investigation of this area was begun by the Biological Station at Górki Wschodnie in 1955 only. It is possible that the ships sailing between the Firth of Vistula and Gdańsk became vehicles contributing to spread this species from one area to another or the crabs may have appeared independently in the Firth of Vistula and in the Gdańsk harbour. From Gdańsk, its invasion of the Dead Vistula would proceed by means of natural migrations of adult individuals or planktonic larval forms, which seems probable because, as Stock (1954) reports, the biology of this crab is similar to that of Eriocheir sinensis. Both these species are known to dig corridors along shores, which behaviour might be one of the ways of their horizontal spreading.

No evidence has so far been reported as to the occurrence of this crab at any point along the Polish Baltic coast between the Firth of Szczecin and the Firth of Vistula.

The discontinuous distribution of Rhithropanopeus in Poland or in Europe in general indicates that besides definite salinity and the sailing of ships into those areas some specific biocenological conditions are required among which nutritional factors no doubt play a very important role. However, data related to this problem are controversial. Mordukhay-Boltovskoy (1952), for instance, maintain that the crab feeds on various organic matter of both animal and vegetable origin. Basing their view on the studies of crab stomachs, Murina and Reznichenko (1960) claim that Rhithropanopeus is a predatory species feeding mainly on Neomysis vulgaris. Our observations indicate that this crab's food consists of animal and vegetable matter.

The explanation of the causes of this strange distribution of the crab requires further investigations - and particularly biocenotic investigations to be carried out simultaneously in all the areas concerned.

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