



(From the topographical map 69 V. 2 Jakobshavn; Grönland 1:250 000; surveyed 1931—32, Geodetic Institute, Copenhagen 1953).

AN OBSERVATION ON YOUNG SPECIMENS OF *AMMODYTES DUBIUS*

By CHARLOTTE HOLMQUIST

In the summer of 1956 I paid a visit to the Danish Arctic Station at Godhavn, Greenland, for some zoological investigations. On the 26th of July a survey was undertaken of the waters off Atâ on the eastcoast of Arveprinsens Ejland, 69°46' N, 50°57' W (see map). During the investigation of the boat-harbour, a bay to the south-west of Atâ, the tide was coming in, driving a great many larger and smaller pieces of icebergs into the bay. One of these lumps of ice came alongside our rowing-boat and, looking on it, I saw something that was rather interesting.

The little piece of ice, one metre or a little more in diameter, had some excavations, two of which were about half a metre in diameter and formed something like diminutive lagoons. In these ice-lagoons some small creatures were swimming around or resting on the bottom. None of these animals were found outside the lagoons, none of them made any efforts to get out into the open water, and if one was put to the mouth of the lagoon it immediately went inwards again. When swimming about they were very lively. They proved to be some young fish, a few centimetres in length, very transparent, with black eyes and with some distinct pigment rows. I took some of them and preserved them for identification later on.

On examination the fish were found to belong to the genus *Ammodytes*. They are elongate, and of the paired fins the pelvic ones are lacking. Ten of the specimens were more thoroughly examined and, for counting of the vertebrae, made transparent by benzyl benzoate. In these specimens, 25—29 mm in length, the number of vertebrae is 74—78; the number of pectoral fin rays = 13—14; dorsal fin rays = 63—68; anal fin rays = 32—35. These figures quite agree with those given in the literature for *Ammodytes dubius* Reinhardt 1838 (JENSEN, 1941, p. 26). According to JENSEN, who tried to solve the problem, it should, however, be considered as a subspecies of *Ammodytes lancea* Cuvier and thus in reality be called *A. lancea dubius* Reinhardt (1941, p. 29). Other sub-

species of *A. lancea* should be *A. lancea lancea* Cuvier and *A. lancea marinus* Raitt.

In his paper of 1941 (p. 24) JENSEN gives a "chart sketch of West Greenland showing localities where *A. marinus* and *A. dubius* have been taken". From this map and from the list on p. 22 it is seen that in the Disko Bugt area *A. dubius* is taken at four localities, i. e. Egedesminde and a locality near to it (Manitsoq?), Ikamiut and Christianshaab, which are all situated in the southern part of the Bay; *A. marinus* is taken at two localities: Godhavn and Jakobshavn. Furthermore JENSEN says (p. 25): "Among the Greenland specimens of *Ammodytes* there is one . . . sent down in 1911 by Mr. M. PORSILD, the leader of the arctic station in Godhavn. . . . is referable to *A. lancea*. It is hardly accidental that *A. lancea* occurs, though evidently rarely, just at Godhavn, since among the 13 specimens examined from this place there is no *A. dubius*, but only 12 *A. marinus* . . .". The differences in the distribution in the Disko Bugt area, as apparent from these records, may be due to differences in sampling at the various localities. I quote once more from JENSEN (1941, p. 30 and 31): "As regards the vertical distribution there is thus on the whole a distinct difference between *A. lancea* and *A. marinus*, the former being found in fiords and near the coasts in shallow water, while the latter occurs away from the coast in deeper water. . . . Finally, *A. dubius* is a pronounced arctic subspecies, since it occurs at Greenland, being the predominant form there." The collecting may have been done in shallower water in some localities, in deeper water in others. Without such a supposition the geographical distribution of these animals in the Disko Bugt area seems to me rather curious.

The present record of *A. dubius* from the sea off Atâ adds to our knowledge of its distribution in the area. It is, however, not easy to say from where the piece of ice came, with the specimens in the ice-lagoons. *A. dubius* may be found in the open water off Atâ though I did not notice it. Some icebergs were seen in the Atâ Sund. They came from the waters and from the glaciers to the north-east of Atâ Sund (see map). One of the larger ones had run ashore just off Atâ at the time for the visit. Now and then smaller and larger pieces were broken off from the icebergs. If the piece of ice with *Ammodytes dubius* in its lagoons came from such an iceberg in the vicinity, or if it had drifted all the way from the glaciers, I do not know. It is, however, noteworthy that the small animals seemed to have adopted this curious locality as a quite natural dwelling-place, since they did not even try to escape into the open water but immediately went back into the ice-lagoon when put to the mouth of it. They may have drifted like that a good way.

There seems to be very little known on the ecology of *Ammodytes dubius*. JENSEN says (1941) on the species *Ammodytes lancea* s. l. (p. 31):

"The general impression is, in my opinion, that the different conditions under which the species *Ammodytes lancea* lives, e. g. depth, temperature and salinity of the water, spawning time, contribute towards the formation of subspecies and races, which in this respect can be considered as ecologically conditioned." But as far as I can see nothing is mentioned about the depth, the temperature and the salinity of the water etc. in the different localities. JENSEN only states that "most of them are from fiords or near the coast; some from banks . . ." (p. 7). Some notes are given by DUNBAR & HILDEBRAND (1952, p. 112) according to *A. dubius*: "... taken in plankton nets . . ., in quite shallow water (five to six metres). The bottom was a muddy glacial sand." Otherwise the ecology of these animals seems to be quite unknown. It seems as if the taxonomy of the different species or subspecies has been the main interest of the investigators of the genus *Ammodytes*.

In the boat-harbour at Atâ the salinity of the surface water proved to be 27.9 ‰ at the time for the investigation (26/7 1956; tide setting in); 1.5 m depth — 30.1 ‰; 5 m — 31.7 ‰ (bottom). The temperature measured was: 1.5 m — 5.25° C; 5 m — about 4.75° C. However, these conditions may have differed considerably from those in the ice-lagoons where the young *Ammodytes dubius* were found. Unfortunately, the particular conditions of the lagoons were not investigated because of shortage of time, but on account of melting of the ice the water in the lagoons may have been of a lesser salinity. Anyhow, it must have been considerably colder within the lagoons than in the water of the boat-harbour. The fish also rested for long periods just on the ice, i. e. at the bottom of the lagoons, which must have been rather cold. Perhaps the fact that the young *A. dubius* may prefer a fairly low temperature will explain why these animals did not turn outside the ice-lagoons and why they immediately went inside when put to the mouth of the lagoon. It may be that they also were protected from predators on these extreme localities and thus were retained. So far as I can discover, there is nothing known on the spawning of *A. dubius*. This may take place in shallow water near to the glaciers or else near to ice where the surface water on account of melting of the ice is of a lesser salinity than the general sea-water and has a lower temperature. Perhaps it would be worth while investigating.

Literature.

- BRUNN, ANTON FR., 1941: Observations on North Atlantic Fishes. 1. *Acanthocottus lilljeborgi*. 2. The *Ammodytes lancea* Group. — *Vidensk. Medd. fra Dansk naturh. Foren.* **104**.
- DUNBAR, M. J. and HILDEBRAND, H. H., 1952: Contribution to the Study of the Fishes of Ungava Bay. — *Journal of the Fisheries Research Board of Canada*, IX.
- JENSEN, AD. S. 1941: On subspecies and races of the lesser sand eel (*Ammodytes lancea* s. lat.). — *Det Kgl. Danske Videnskabernes Selskab. Biologiske Meddelelser*, XVI, 9.
- REINHARDT, JOHANNES 1838: Ichthyologiske Bidrag til den Grønlandske Fauna. — *D. Kgl. Danske Vidensk. Selskab, Skrifter nat. og math.*, Afd. 4, VII.