



Hydrographic changes push European common squid *Alloteuthis subulata* into Kiel Bay, western Baltic Sea



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Introduction

The European common squid *Alloteuthis subulata* (Fig. 1) is by far the most abundant cephalopod in the North Sea and the adjacent Skagerrak and Kattegat where the animals form dense aggregations over sandy and muddy bottom in shallow areas. Mature specimens appear in March/April and spawning peaks in the summer months (June/July); a second spawning season occurs in September. It is believed that in autumn and early winter the juveniles leave the North Sea migrating via the English Channel to the Atlantic. Their beaks (Figs. 2 and 3) are frequently found in stomach contents of fish and marine mammals emphasizing the importance of this squid as key prey of abundant North Sea predators.

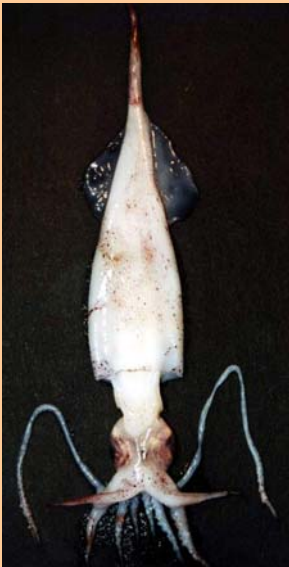


Fig. 1. *Alloteuthis subulata*, ventral view, DML = 43 mm

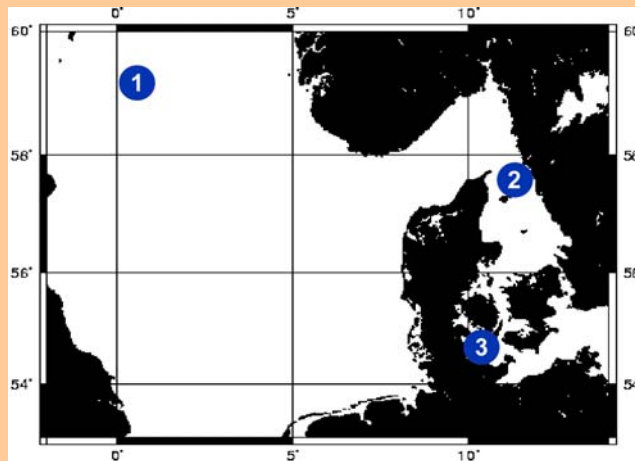


Fig. 4. *Alloteuthis subulata*, study area. Station 1 (North Sea): 73 specimens; Station 2 (Kattegat): 51 specimens; Station 3 (western Baltic Sea): 18 specimens



Fig. 2. *Alloteuthis subulata*, lower beak, lower rostral length = 0.84 mm



Fig. 2. *Alloteuthis subulata*, upper beak, upper rostral length = 0.92 mm

Data collection and first results

Alloteuthis subulata were sampled in the North Sea from the by-catch of an ICES bottom-trawl survey (GOV net) of FRV Walter Herwig III in February 2000; in the Kattegat from catches taken during a benthos survey with beam trawls of RV Littorina in November 2000; and in the western Baltic Sea, Kiel Bay, during a demersal fish survey with 80 feet bottom trawls of RV Alkor in January 2001 (Fig. 4).

In total, 142 specimens were collected, with 51 % females, 46 % males, and 3% immatures. Dorsal mantle length (DML) varied between 25-85 mm in females and 27-98 mm in males. DML frequency distributions pointed out different size ranges of *A. subulata* in the three target regions (Figs. 5): Generally, smallest specimens occurred in the Kattegat (November). In Kiel Bay (January) and in the North Sea (February) body sizes were larger, with their frequency distributions covering a broader size range. The size distributions suggest that these animals were part of a population which stayed in the North Sea and its adjacent eastern regions - not leaving towards the Atlantic. A notable southerly influx of more saline water (25 psu) from the Kattegat into the eastern Baltic Sea possibly transported them to an area, the Kiel Bay, which they normally avoid due to its commonly low salinity below 20 psu.

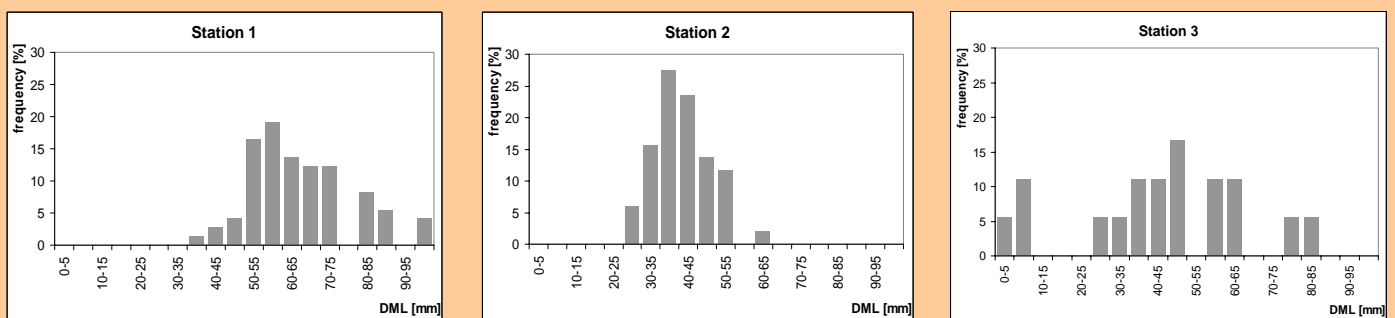


Fig. 5. *Alloteuthis subulata*. Length frequency distribution of DML in the North Sea, February 2000 (Stat. 1), Kattegat, Nov. 2000 (Stat. 2), and Kiel Bay, western Baltic Sea, January 2001 (Stat. 3)

Conclusions

There is much speculation about the easternmost distribution of *Alloteuthis subulata*. It is very common in the North Sea and regularly, although not abundant, occurring in the Kattegat, whereas recordings from the Baltic Sea are sparse and mostly anecdotic. Here we report on an unusual collection of 18 specimens which were sampled in January 2001 in Kiel Bay during a period of water influx which brought more saline Kattegat water into the low saline western Baltic Sea. This caused an unusual increase of salinity (25 psu) in Kiel Bay, and we consider this uncommon hydrographic event to be responsible for the sudden occurrence of *A. subulata* in the western Baltic Sea.