Faster or slower: has growth of eastern Baltic cod changed?

Recent environmental changes have influenced the ecology and biology of eastern Baltic cod. Declining somatic condition, maturation at smaller size and restricted size distribution of the population suggest that growth rates have decreased between the early 2000s and the 2010s. Extensive age estimation problems have until now precluded testing of this hypothesis. This study presents evidence for a decrease in somatic growth rate of Baltic cod.

Temporal patterns of growth, condition and maturation were analysed based on two complementary analyses: length frequency mode progression derived from DATRAS bottom trawl survey data and known-age samples, where size at age was back-calculated from daily otolith growth patterns. In the known-age samples, growth was positively related to somatic condition at capture with maturity dependent differences. Immature individuals had experienced significantly lower growth and were in lower condition at capture than mature individuals. Growth rates in the known-age samples were estimated at 9.5, 7.8 and 5.7 cm per year for age classes 1, 2 and 3 respectively. Growth between age 2 and 3 decreased significantly from 8.8 cm in the 1997 year class to 7.6 cm in the 2010 year class. While the 2001 and 2004 known-age samples were representative for the population, the 2013 sample was biased towards individuals with a higher condition and growth. Complementary length frequency analysis following the length mode of fish from age 2 to age 3 confirmed growth estimates from the early 2000s, while suggesting a 37.5% lower growth in 2013 compared with 2005.