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First-year survival of North East Atlantic mackerel (Scomber scombrus) from 1998 to 2012 appears to be driven by availability of Calanus, a preferred copepod prey - DTU Orbit (09/11/2017)

First-year survival of North East Atlantic mackerel (Scomber scombrus) from 1998 to 2012 appears to be driven by availability of Calanus, a preferred copepod prey

Mackerel (Scomber scombrus) is one of the ecologically and economically most important fish species in the Atlantic. Its recruitment has, for unknown reasons, been exceptional from 1998 to 2012. The majority (75%) of the survivors in the first winter were found north of an oceanographic division at approximately 52°N, despite the fact that mackerel spawns over a wide range of latitudes. Multivariate time series modelling of survivor abundance in the north revealed a significant correlation with the abundance of copepodites (stage I–IV) of Calanus sp. in the spawning season (April to June). The copepodites were a mix of C. helgolandicus (dominating) and C. finmarchicus. The growth of mackerel larvae is known to be positively related to the availability of nauplii and copopodites of preferred prey species, namely, large calanoid copepod species such as Calanus. The statistical relationship between mackerel survivors and abundance of Calanus, therefore, most likely, reflected a causal relationship: high availability of Calanus probably reduced starvation, stage-specific predation and cannibalism (owing to prey switching). The effects of other abundant, but less preferred zooplankton taxa, (Acartia sp., Branchiopoda spp. and Echinodermata spp. larvae), as well as stock size, temperature and wind-induced turbulence were not found to be significant. However, stock size was retained in the final model because of a significant interaction with Calanus in oceanic areas west of the North European continental shelf. This was suggested to be a consequence of a density driven expansion of the spawning area that increased the overlap between early life stages of mackerel and food (Calanus) in new areas.

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