ICES/PICES 6ZPS 2016/S3

Biology and ecology of the siphonophore Muggiaea atlantica in the northeast Atlantic

Michael Blackett, Cathy Lucas and Priscilla Licandro

As a result of their opportunistic ecology, jellyfish populations fluctuate dramatically in space and time. These fluctuations are driven by both biological factors that affect their demographic rates and also by physical factors that influence their dispersal. Over recent decades, the siphonophore Muggiaea atlantica has expanded its distribution, successfully colonising areas of the Mediterranean and Pacific and invading novel habitats in the North Sea. However, these changes are not clearly understood because the processes involve a complex interaction of the biological and physical factors. We investigated long-term changes in the abundance and distribution of M. atlantica in UK waters using time-series data from a network of coastal monitoring stations. Our aims were to assess the extent of the species geographical expansion and to investigate the key environmental factors that modulate its population dynamics. Our results show that there has been a dramatic progressive northward extension of this species' distribution in the northeast Atlantic since the late 1960s. These changes involved the establishment of a resident population in the Western English Channel (WEC) and the subsequent establishment of seasonally transient populations in Scottish coastal waters, an area where the species was historically absent. Temperature and food availability were shown to be key determinants of local M. atlantica recruitment in the WEC, whilst in Scottish waters the species occurrence was dependent upon immigration via current-driven transport. These distributional changes are discussed in the context of source sink-dynamics and the species ecological requirements.

Keywords: jellyfish; source-sink dynamics; population ecology; Muggiaea atlantica; biogeography

Contact author: Michael Blackett. PhD student, National Oceanography Centre Southampton & Sir Alister Hardy Foundation for Ocean Science. mb10g11@noc.soton.ac.uk. +44 7462 575300.