



Synchronisation in the molting and spawning activity of northern krill (*Meganyctiphanes norvegica*) and its effect on recruitment

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ABSTRACT: The molting, spawning, and recruitment of northern krill (*Meganyctiphanes norvegica*) were analyzed over an annual cycle (1999-2000) in the Clyde Sea (west coast of Scotland). Results supported the hypothesis of a functional relationship between egg production and molt development for the duration of the reproductive season (March to August), with one reproductive cycle being made up of two molt cycles. Females remained in reproductive condition throughout the reproductive season, and the timing of their spawning and molting was synchronized at the population level throughout this period. A semiempirical model predicted that the krill population produced an egg pulse every 20 to 26 d (depending on temperature), and three cohorts were evident in net samples taken later in the year. The likely date on which the first cohort was spawned was around 26 d after the main phytoplankton bloom, suggesting that the bloom triggered egg development in all adult females. Such a synchronized spawning period was observed directly in adult females 26 d after a bloom in March 2000. A total of three cohorts over the 6-month reproductive season is less than the maximum of seven that would be possible if spawning occurred at a periodicity of between 20 and 26 d, suggesting that larval recruitment was not always successful. Analysis showed that successful recruitment was only achieved when chlorophyll a levels were adequate during both the period of egg maturation in the ovary and the subsequent development of larvae, especially the furcilia stages.

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