

Chapter 6

Lunar Periods in the Annual Reproductive Cycles of Marine Invertebrates from Cold Subtidal and Deep-Sea Environments

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Abstract Moon-related rhythms of reproduction in the sea were originally evidenced and studied in selected species from tropical or subtropical nearshore or tidal environments. They are now being recorded across a widening range of taxa, habitats, and depths. Although still poorly understood, lunar components in the cyclic breeding of boreal subtidal and deep-sea organisms contribute to extend the putative influence of celestial forces to the most remote regions of the globe. Such occurrences deserve more attention if we are to develop a comprehensive understanding of biological rhythms. The present chapter reviews and discusses putative drivers of lunar periodicities and their adaptive significance in previously neglected taxa. It shows that the interplay between the moon and the sun seems to provide a diversity of marine organisms with a means to coordinate their reproductive events. However, universal underlying pathways have yet to be identified.

Keywords Cold-water corals • Echinoderms • Gametogenesis • Larval release • Spawning periodicity

6.1 Introduction

Reproductive activity is one of the most important and widely studied life history features in aquatic animals. It is therefore not surprising that some of the earliest phenomena to be tied to a lunar periodicity revolve around the reproduction of marine invertebrates. Swarming of the Pacific palolo worm, *Palola* (= *Eunice*) *viridis*, on a specific lunar phase was first recorded more than a century ago (Friedlaender

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