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Reproductive longevity in two species of polychaetous annelids

DONALD J. REISH[1], KARIN DE CALLIBUS, JESSICA DEWAR & CHERYL BUBE
Department of Biological Sciences, California State University, Long Beach, Long Beach, California 90840.
[1]Corresponding author. E-mail: DJReish@aol.com

Abstract

Polychaetes reproduce many different ways. Regardless of the method of reproduction very little is known on how long an individual, which reproduces multiple times, can live. In attempt to answer this question two species of laboratory reared polychaetes, *Neanthes arenaceodentata* and *Dinophilus gyrociliatus*, were selected for this study. The female *N. arenaceodentata* lays her eggs in a tube, then dies. The male incubates the embryos for 21–25 days and is capable of reproducing again. One male spawned nine times, but the eggs were not fertilized the eighth and ninth time. He lived 13 months. *D. gyrociliatus* is a minute species which lays two sizes of eggs within a capsule. The smaller ovum develops into a male, fertilizes the larger sized female ova within the capsule, and then dies. The maximum number of capsules and female ova occurred during the first three egg layings then decreased. The oldest worm reproduced 11 times and lived 63 days. Morphological changes with age were noted in both species.

Key words: ova production, life history, aging, feeding, abnormalities, *Neanthes arenaceodentata, Dinophilus gyrociliatus*

Introduction

Polychaetes reproduce in a variety of ways (see review by Giangrande 1997). Many species reproduce once then die such as epitokal nereids (Reish 1954). Others develop reproductive stolons at the posterior end which break off, swim to the surface, release their gametes, and die. However, the parent survives and continues to live to produce additional stolons. This is a common method in syllids (Heacox 1980). Hermaphroditism occurs in many polychaete families, for example, serpulids (Qiu & Qian 1998). *Eurythoe complanata* (Pallas) can reproduce sexually or by fragmentation with each part capable of forming a head and a tail (Kudenov 1974; Reish et al. 1989). While a considerable amount is known on the different modes of reproduction in polychaetes, very little is known on how many times an individual can reproduce and how long it can live. *Capitella* sp. individuals are known to reproduce five times in their lifetime (Qian & Chia 1992); *Ophryotrocha diadema* Åkesson reproduces many times (Åkesson 1982), and *Polydora cornuta* (Bosc) can reproduce multiple times (Rice et al. 2008); however, no mention was made of aging in these species other than the decline in reproductive rate.

The purpose of this study was to determine how many times an individual polychaete can reproduce and if the individual worm shows any morphological changes due to aging. For this study we selected two species of polychaetes which have been raised in laboratory cultures for many generations: *Neanthes arenaceodentata* (Moore, 1903) and *Dinophilus gyrociliatus* Schmidt, 1857.

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