Zoosymposia 7: 173–176 (2012)
www.mapress.com/zoosymposia/

ISSN 1178-9905 (print edition)
ZOOSYMPOSIA
ISSN 1178-9913 (online edition)

Autotomy of rays of *Heliaster helianthus* (Asteroidea: Echinodermata)*

JOHN M. LAWRENCE[1,3] & CARLOS F. GAYMER[2]

[1] *Department of Integrative Biology, University of South Florida, Tampa, Florida, USA*
[2] *Departamento de Biología Marina, CEAZA and IEB, Universidad Católica del Norte, Coquimbo, Chile*
[3] *Corresponding author, E-mail: lawr@usf.edu*

**In*: Kroh, A. & Reich, M. (Eds.) Echinoderm Research 2010: Proceedings of the Seventh European Conference on Echinoderms, Göttingen, Germany, 2–9 October 2010. *Zoosymposia*, 7, xii+316 pp.

Abstract

In species of the family Heliasteridae, the ossicles of the proximal parts of the sides of each ray are joined by connective tissue to those of the adjacent rays to form interradial septa. These provide support to the extensive disc. Only a relatively small part of the ray is free. Autotomy of rays occurs in *Heliaster helianthus* in response to predatory attack by the asteroid *Meyenaster gelatinosus*. Autotomy of the ray does not occur at the base of the free part of the ray (arm) but near the base of the ray. In addition to the plane of autotomy at this location, a longitudinal plane of autotomy occurs in the connective tissue between the ossicles of the interradial septa. This indicates a plane of mutable collagenous tissue is present. Autotomy of the ray involves all these planes of autotomy and results in loss of most of the ray.

Key words: Asteroidea, Heliasteridae, autotomy, ray loss, mutable collagenous tissue

Introduction

Autotomy of rays occurs near the base of the arm (the free part of the ray) in most asteroids (Emson & Wilkie 1980). Exceptions are the luidiids (Emson & Wilkie 1980), astropectinids (Hotchkiss 2009) and archasterids (Lawrence *et al.* 2011) where it can occur at any point along the length of the ray. Autotomy involves mutable collagenous tissue in the body wall in a plane of autotomy (Wilkie 2002).

Agassiz (1877) called the inward continuation of the interradius of *Asterias forbesi* and *Pisaster ochraceus* the interbrachial partition. Viguier (1879) clearly illustrated two sets of ossicles in the interradial septa of the rays of the multirayed *Heliaster microbrachia*. Clark (1907) reported ray regeneration in *Heliaster* species but did not refer to the location where ray loss had occurred. Viviani (1978) specifically described autotomy of rays by *Heliaster helianthus* in response to the presence of its predators, *Meyenaster gelatinosus* and *Luidia magellanica*. His illustrations show autotomy does not occur at the base of the free part of the ray, the arm, but at the base of the ray near where it joins the central part of the body that contains the cardiac stomach. This raises the question of how the interradial septa of adjacent rays are separated in the process of autotomy.

Accepted by A. Kroh & M. Reich: 27 Oct. 2012; published 12 Dec. 2012