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Redescription and notes on the reproductive biology of the sea anemone *Urticina fecunda* (Verrill, 1899), comb. nov. (Cnidaria: Actiniaria: Actiniidae)

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Abstract

The externally brooding sea anemone *Epiactis fecunda* (Verrill, 1899) is redescribed as *Urticina fecunda*, comb. nov., on the basis of preserved type material and anatomical and behavioural observations of recently collected animals. The seasonal timing of reproduction and aspects of the settlement and development of brooded offspring are reported. Precise locality data extend the bathymetric range to waters as shallow as 10 m, and the geographical range east to the Avalon Peninsula (Newfoundland, Canada). We differentiate it from other known northern, externally brooding species of sea anemone. Morphological characters, including verrucae, decamerous mesenterial arrangement, and non-overlapping sizes of basitrichs in tentacles and actinopharynx, agree with a generic diagnosis of *Urticina* Ehrenberg, 1834 rather than *Epiactis* Verrill, 1869.

Key words: Brooding, *Epiactis*, *Epigonactis*

Introduction

Since its original description in 1899 based on two preserved specimens, no subsequent collection of the species currently known as *Epiactis fecunda* (Verrill, 1899) has been reported in the literature, nor have details of its life history nor descriptions of the live animal. Originally described as *Epigonactis fecunda*, this species was noted to retain developing juveniles (i.e. to brood its offspring) within individual pits in the distal portion of the external surface of its column. Carlgren (1901) synonymized the species with its only congener, *Epigonactis regularis* (Verrill, 1899) and transferred the species to *Epiactis*, a genus notable among actinarians for its many brooding species.

Although Verrill's original description mentioned and depicted verrucae on the column of his specimens of *Epigonactis*, a feature contrary to any diagnosis of *Epiactis* (see Verrill 1869a; Stephenson 1918, 1922; Carlgren 1921, 1949), Carlgren's (1901) recommendation that *Epigonactis* be synonymized with *Epiactis* has been broadly adopted (e.g. Stephenson 1918, 1922; Dube 1974; Sebens 1998). Carlgren (1901) also considered one individual of the type series of *Leiothealia spetsbergensis* (Kwietniewski, 1898) to be *Epigonactis fecunda*. This individual is the source for European records of *Epiactis fecunda* in biodiversity databases (e.g. European Register of Marine Species website), but the currently confirmed distribution of the species is subtidal deep waters of Nova Scotia and southwestern Newfoundland (see discussion).

In addition to these taxonomic issues, the mode of attachment of offspring to the adult has been of some interest. Verrill (1899) suspected that offspring of externally brooding species attached to the body wall as eggs or zygotes, but Carlgren (1901) thought it more likely that attachment occurred at the motile planula stage. Directly developing eggs or zygotes have been previously reported as being actively placed by the parent (Ishimura & Nishihira 2003) or expelled with mucus (Uchida & Iwata 1954; Dunn 1975), but until now planulae have not been observed attaching externally to adults (see below).