



The hydroid and early medusa stages of the deep sea jellyfish *Earleria purpurea* (Hydrozoa: Mitrocomidae) from the Monterey Bay Submarine Canyon, USA

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Abstract

The hydroid and early medusa stages of the deep sea hydrozoan jellyfish *Earleria purpurea* (Hydrozoa: Mitrocomidae) are described. Mature medusae were collected from the Monterey Bay submarine canyon near Monterey, California, USA utilizing a remotely operated vehicle and returned to the laboratory for culturing. *In vitro* fertilized eggs developed into free-swimming planulae larvae that settled and metamorphosed into benthic hydroid colonies consisting of feeding hydranths and medusa producing gonangia. Newly released medusae were grown to maturity and placed on educational display at the Monterey Bay Aquarium. The hydranths and gonangia were compared and found to be distinct from those of *E. corachloae* the only other member of the Genus *Earleria* with a described life cycle.

Key words: hydromedusae, hydrozoan, life history, Monterey Bay, hydranth, gonangium, *Earleria*, Mitrocomidae

Introduction

Medusae of the transparent deep sea hydrozoan jellyfish *Earleria purpurea* (Foerster) are medium-sized with bell diameters and heights ranging up to 40mm and 20mm respectively (Foerster 1923; Wrobel and Mills 1998; this study). They range from central California to British Columbia (Kramp 1968; Wrobel and Mills 1998) and healthy specimens are usually found in waters deeper than 200m. Similarly, most of the other six presently known species of *Earleria* are also from the deep sea (Foerster 1923; Gili *et al.* 1998; Gili *et al.* 1999; Hosia and Pagès 2007; Widmer *et al.* 2010) with the exception of *E. bruuni* (Navas) which have been found between 125–250m deep (Navas 1969; Gili *et al.* 1999). *E. corachloae* is the only member of the Genus *Earleria*, which was formerly known as *Foersteria* (Collins *et al.* 2006), having a life cycle that has been completely described (Widmer *et al.* 2010). Medusae of *E. corachloae* and *E. purpurea* both occur in Monterey Bay, California, USA and occupy similar depth ranges (Widmer *et al.* 2010, this study).

The mature medusa stage of *E. purpurea* was described based upon field-collected specimens (Foerster 1923). However, the complete life cycle including the benthic hydroid stages remained unknown. On 21 August 2009, ten specimens of *E. purpurea* were collected in Monterey Bay, California, USA with a remotely operated vehicle (ROV) during a dive supporting deep sea husbandry research and development at the Monterey Bay Aquarium (MBA). The specimens were returned to the MBA jellyfish laboratory for culturing and *in vitro* techniques were utilized. Fertilized eggs developed into free-swimming planulae larvae that later settled and metamorphosed into benthic hydroid colonies. Newly released medusae were grown to maturity in the laboratory and later placed on educational display at MBA. The purpose of this paper is to describe the benthic hydroid and early medusa stages of *Earleria purpurea*.

Methods and material

Collection of specimens. On 21 August 2009 10 mature medusae of *Earleria purpurea* were collected from the Monterey Bay submarine canyon in Monterey Bay, California, USA using the ROV *Ventana* deployed from the