

Presentation of MAR-ECO Students

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Degree: Ph.D.

Working title of project: Shedding Light on Speciation in the Dark: Evolution of Bioluminescence in the Shining Tube-Shoulders (Teleostei: Platyroctidae)

Supervisors: Dr. John Sparks (AMNH, primary advisor), Dr. Tracey Sutton (VIMS, MAR-ECO)

Summary of Project: Bioluminescence in the deep-sea is pervasive, and is present across such disparate groups as copepods, squid, and fish. It is hypothesized to play an important role in the speciation of many deep-sea groups, used in diverse ways ranging from species signaling to luring prey. Despite this broad biological significance, no study to-date has directly tested whether the evolution of bioluminescent characters is concordant with increased rates of cladogenesis. It is hypothesized that the addition of bioluminescent structures led to an increased rate of diversification among deep-sea fishes. To test this, this study will: 1) generate the first phylogeny for a group of deep-sea fishes, the tube shoulders, 2) map sensory structure and light organ system characters onto this framework phylogeny to reconstruct the evolutionary history of light organ systems in the group, and 3) test for correlation between light organ system number and configuration, and clade diversity.