Project: Examining the Dentition, Tooth Microstructure, and Jaws of a Dietary Specialist, The Prickly Dogfish Shark (*Oxynotus bruniensis*)

Progress Report: During the Fall 2018 semester, the funds awarded for the study of one deep-sea shark’s teeth and jaws, those of the Frilled Shark, were used to study another deep-sea shark’s dentition (with prior approval of B. Normark and D. Irschick). When specimen loaning, handling, and imaging restrictions prevented the detailed study originally proposed, I conducted a parallel study with many of the original goals to study the teeth and jaws of the Prickly Dogfish Shark (*Oxynotus bruniensis*).

Since making the minor change, I have acquired 6 specimens of *O. bruniensis*, a species not previously represented in the Natural History Collection, as well as materials for use in comparative descriptions of tooth arrangement and microstructure. Currently, I have prepared 4 of the specimens as skeletal material, and the remaining two specimens are now fluid specimens suitable for computed tomography (CT) imaging. Currently, these specimens are being scanned by study co-author Mark Riccio. We expect that CT scanning will be completed within the month.

In addition to CT imaging, throughout the fall I made histological preparations of upper and lower jaw teeth of *O. bruniensis* and imaged sectioned teeth using traditional and polarized light microscopy. Light microscopy was complemented by scanning electron microscopy and original illustrations of the overall dentition. Together, these will comprise the first detailed morphological and microstructural study of this species’ dentition.

I, as well as the study co-authors, am particularly excited by recently published accounts of this shark that indicate that it is a dietary specialist. This enables us to examine aspects of tooth morphology and microstructure and consider any morphological extremes in a larger evolutionary context, addressing the questions “how does form correlate to function” and “to what extent does a form of ecological (e.g. dietary) specialization impact morphological specialization”.

Outcomes: To date, I have outlined a manuscript summarizing our findings and have drafted the majority of the figures that will be used in the resultant publication. Once CT scans are completed, the research phase of the project will be finished. I anticipate that a manuscript detailing our work will be submitted for peer-review during the Spring 2019 semester.

* The original scope and title of the project has been changed due to specimen availability and loaning institution policies. Please refer to the email dated September 25, 2018 between Joshua Moyer, Benjamin Normark, and Duncan Irschick (Sally Klingener cc’ed) for approval of project modification.