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First record of *Mollisquama* sp. (Chondrichthyes: Squaliformes: Dalatiidae) from the Gulf of Mexico, with a morphological comparison to the holotype description of *Mollisquama parini* Dolganov

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Abstract

The description of the pocket shark genus *Mollisquama* (*M. parini* Dolganov, 1984) is based on a single known specimen collected from the Nazca Ridge of the southeast Pacific Ocean. A second *Mollisquama* specimen has been captured in the central Gulf of Mexico establishing a considerable range extension and a parturition locality because the specimen has a healed vitelline scar. Both the holotype of *M. parini* and the Gulf of Mexico specimen possess the remarkable pocket gland with its large slit-like external opening located just above the pectoral fin. Features found on the Gulf of Mexico specimen that were not noted in the description of *M. parini* include a series of ventral abdominal photophore agglomerations and a modified dermal denticle surrounded by a radiating arrangement of denticles just posterior to the mouth. Based on a morphometric and meristic comparison of the Gulf of Mexico specimen with information in the description of *M. parini*, the Gulf of Mexico specimen is identified as *Mollisquama* sp. due to differences in tooth morphology and vertebral counts. Phylogenetic analysis of NADH2 gene sequences places *Mollisquama* sister to *Dalatias* plus *Isistius* within the family Dalatiidae.

Key words: pocket gland, photophore agglomerations, molecular systematics, NADH2, dentition

Introduction

Kitefin sharks of the family Dalatiidae (Squaliformes) comprise 7 genera (*Dalatias*, *Euprotomicroides*, *Euprotomicrus*, *Heteroscymnoides*, *Isistius*, *Mollisquama*, and *Squaliolus*) of which five are monotypic–the highest percentage of monotypic genera for any family in the order Squaliformes (Ebert *et al.* 2013). Dalatiids are distinguished from other squaliform sharks by their snout shapes, strong jaws, lower teeth with high-bladelike crowns, dorsal fins without spines (except *Squaliolus*), and the lack of an anal fin. They are distributed world-wide in most temperate, subtropical and tropical marine waters and their life histories, distribution ranges and behavior are often based on few museum specimens and a paucity of reliable observations. Dalatiids are viviparous (Gadig & Gomes 2002) with embryos nourished in utero by a yolk sac. Some species are known to be luminescent (Claes *et al.* 2014), a feature that may aid in attracting prey or as counter-illumination to facilitate predatory behavior. Sharks of the genus *Isistius* (cookie cutter sharks) employ a unique feeding behavior that allows them to use their cookie-cutter-like teeth to excise a nearly symmetrical oval flesh plug from a variety of prey species including marine mammals, tunas, billfishes, and squids (Strasburg 1963, Shirai & Nakaya 1992). Dalatiids in general possess relatively similar dentitions and jaw structures.

One of the rarest monotypic dalatiids, *Mollisquama parini* Dolganov, 1984 was described from a single female specimen collected from the Nazca Submarine Ridge in the southeast Pacific Ocean (Dolganov 1984; translation provided by N. Donoho, pers. comm.). *Mollisquama parini* is unique within Squaliformes because of distinctive dermal denticle morphology and conspicuous external slits that form the opening to a villi-lined internal pocket

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