# An Evaluation of the Nuclear Locus ITS2 and the Mitochondrial Locus COI in Notorynchus cepedianus from 7 Different Geographic Locations Confirms the Presence of a Single Species

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The only extant member of it's genus, the broadnose sevengill shark, Notorynchus cepedianus, is morphologically distinguishable from other elasmobranchs, possessing seven gills, one dorsal fin set near its posterior, and an elongated upper caudal fin. These aforementioned characteristics allow for easy species taxonomy. N. cepedianus is native around the entirety of the globe, preferring shallow and coastal waters, making the species vulnerable to anthropogenic environmental factors. There are currently no conservation efforts to shield this species from harmful anthropogenic actions. There has been proposal that N. cepedianus specimens found in different costal locations is representative of a cryptic species complex, a group of organisms with analogous phenotypes but differing genotypes. In this study, gDNA was extracted from miniscule fin samples of N. cepedianus specimens located off the coasts of California, Peru, Argentina, South Africa, South Australia, Tasmania, and New Zealand. DNA sequences were obtained for two genetic loci, the nuclear locus internal transcribed spacer 2 (ITS2) and the mitochondrial locus cytochrome oxidase 1 (mtCOI). One genetic clade was detected for the locus ITS2 and two genetic glades observed amongst the locus mtCOI. The relatively small genetic differentiation between the specimens from different costal locations is too low to extrapolate the presence of a cryptic species complex. Thus, a classification based on a morphological assay is a sufficient method of taxonomy for this species of shark. Evidence of female philopatry and male-mediated gene flow is indicative of a need for specialized conservation efforts pursuant to gender.

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