



## Genetic population structure of the angular angelshark, *Squatina guggenheim*, an endangered endemic species from Southwest of the Atlantic Ocean

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**Palavras-chave:** Cytochrome b, Genetic diversity, Conservation genetics.

The angel sharks of the *Squatina* genus comprise 22 valid coastal benthic shark species, which inhabiting tropical and subtropical waters in continental shelves worldwide. Among these species, the angular angelshark, *Squatina guggenheim*, is an endangered endemic species from Southwest Atlantic with a limited range distribution between Espírito Santo state, southeast Brazil and Central Patagonia in Argentina. It is caught as bycatch by small-scale industrial and artisanal fisheries. However, its population genetic structure remains unclear. Therefore, this study aimed to assess the genetic population structure and genetic diversity of the angular angelshark, based on 781 bp of the mitochondrial DNA cytochrome *b*. A total of 61 individuals were sampled from 9 areas along the Southwest Atlantic. The mitochondrial sequences revealed 32 polymorphic sites, 45 haplotypes, with overall haplotype and nucleotide diversities of 0.623 ( $\pm 0.040$ ) and 0.00099 ( $\pm 0.00012$ ), respectively. In order to a wider Analyses of Molecular Variance (AMOVA), haplotypes (JX312439 - JX312507) from Garcia et al. (2014) were coupled to our sequence dataset, totalizing 129 sequences. The AMOVA showed the existence of at least three genetically distinct populations in Southwest Atlantic: Southeastern Brazil; South of Brazil and region of Rio de la Plata Estuary ( $K_{ST} = 0.17418$ ,  $P < 0.00001$ ). The  $F_{ST}$  pairwise differences ranged from -0.00558 to 0.44120, suggesting the existence of restricted gene flow between geographically distant groups. In addition, the median-joining haplotype network revealed a star-shaped pattern. The H2 was the more frequent haplotype, and it was present in all populations identified. The genetic relationships of the haplotype network do not express the presence of structured groups for cytochrome *b* gene. However, 39 haplotypes found only in the Rio de la Plata region indicate a high genetic diversity to this region and high indices of genetic divergence among the groups. These outcomes suggest that management and conservation plans for the angular angelshark should consider the genetic heterogeneity information in order to safeguard the evolutionary potential of this imperiled endemic shark species.