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Abstract

Atlantic Bonito (*Sarda sarda*) Genomic ddRadSeq Analysis Confirms Population Differentiation across Northeast Atlantic and Mediterranean Locations—Implications for Fishery Management †

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Abstract: Atlantic bonito (*Sarda sarda*) is an epipelagic migratory species of the family Scombridae and it is usually classified under the common name of small tuna. This species is heavily targeted by artisanal and commercial fisheries in the northeast Atlantic and Mediterranean. However, no management directive has been proposed for this species. In 2019, ICCAT (International Commission for the Conservation of Atlantic tuna) identified the Atlantic bonito as a critical species to be studied, due to the lack of knowledge in several key biological aspects such as growth, reproduction, and stock structure. In a preliminary genetic analysis of more than 600 individuals from the Northeast Atlantic and Mediterranean, using a single molecular marker (mitochondrial DNA control region), we detected a significant genetic differentiation between two groups of locations. One group with two locations within the Mediterranean (Spain and Tunisia) and one location in the Atlantic near to the strait of Gibraltar (Portugal); and another group comprising locations along the African coast (Morocco, Mauritania, Senegal, and Côte d'Ivoire). A new analysis, using a genomic approach (ddRadseq analysis) confirm the same populations structure. Population genetic analysis of 95 individuals from seven locations recovered more than 8500 SNPs with a coverage greater than 20X (mean = 27.9; SD = 16.8) and confirmed that the genetic discontinuity is not placed in the Strait of Gibraltar. The locations from north and south Portugal were grouped together with the two locations within the Mediterranean Sea (Spain and Tunisia) and clearly differentiated from the rest of locations in the African coast (Morocco, Senegal, and Côte d'Ivoire). These results updated the genetic population structure of Atlantic bonito, and they can be used as starting point to infer a proper management regulation for this relevant commercial species.

Keywords: Atlantic bonito; *Sarda sarda*; population genomic structure; ddRadseq; fishery management; genomic analysis; northeast Atlantic; Mediterranean

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