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Abstract

Population Structure of the Brazilian Carapeba *Eugerres brasilianus* in a Complex of Lagoon Systems from Southwest Atlantic Ocean Inferred from Otolith Elemental and Shape Signatures †

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Abstract: The Brazilian mojarra, *Eugerres brasilianus*, is an economically important species for the artisanal fisheries that exist in the estuarine environments along the Southwest Atlantic Ocean. Despite this, knowledge about its population structure is scarce, and no management strategies have been applied to ensure the sustainability of *E. brasilianus* fisheries in Brazil. Thus, the present study intended to understand the population structure of *E. brasilianus* in a complex system of lagoons in the Southwest Atlantic Ocean. A total of 90 individuals were collected in the lagoons of Piratininga-Itaipu (IP), Saquarema (SQ) and Araruama (AR) between December 2019 and March 2020. For the analyses, 30 individuals per location from the same age group (2 years old), following age estimation by counting the annual growth increments, were used. The contour of the shape of each otolith was evaluated using elliptical Fourier descriptors (EFD). Multi-elemental signatures (MES) of the whole otoliths were obtained using solution-based inductively coupled plasma mass spectrometry. Data were analyzed using univariate and multivariate statistics to assess the degree of separation between individuals from different lagoons. EFD data showed differences between regions. MES exhibited distinct regional patterns, mainly driven by differences in Sr/Ca, Mg/Ca, Mn/Ca, Li/Ca and Cu/Ca ratios. Reclassification accuracy rates obtained from linear discriminant function analyses using both EFD and MES of otoliths were 100% (IP), 90% (SQ) and 97% (AR). Therefore, a clear distinction between the population groups was observed, probably related to the inherent characteristics of each lagoon system, their semi-restricted connectivity with the adjacent coastal zone, as well as the estuarine-opportunistic behavior of the species. Thus, the results suggest that these fisheries should be managed as different population-units.

Keywords: Gerreidae; Sagittae; natural tags; contour and chemical analyses

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