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Abstract

Landmark-Based Geometric Morphometrics Approach to Unravel the Population Structure of the Bluefish (*Pomatomus saltatrix*) in Southeastern–South Brazil †

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† Presented at the XI Iberian Congress of Ichthyology, Vila Real, Portugal, 23–27 June 2026.
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Abstract

Introduction: Understanding population structure is essential for the effective management of marine resources. The bluefish (*Pomatomus saltatrix*) is a widely distributed and commercially important species along the Brazilian coast, yet its population structure in the South–Southeastern region remains unclear. **Objectives:** This study aimed to assess the body morphological variation and to infer the population structure of *P. saltatrix* along the South and Southeastern coasts of Brazil using a landmark-based geometric morphometrics method. **Methodology:** Individuals were collected between August and October 2024 from artisanal fisheries in Rio de Janeiro (n = 46), São Paulo (n = 37), and Santa Catarina (n = 29). A total of 12 landmarks were used to derive a truss network and extract 25 transformed distances (DTs). Data were analyzed using univariate (one-way ANOVA, followed by Tukey's test if needed, or Kruskal–Wallis followed by Dunn's test if needed) and multivariate statistics (PERMANOVA and Flexible Discriminant Analysis (FDA)). **Results:** Significant regional differences were detected for most DTs, except DT3, DT4, DT6, DT9, DT13, DT24, and DT25. PERMANOVA revealed significant differences among all sampling locations, including pairwise comparisons ($p < 0.05$). FDA achieved an overall reclassification success of 93% of individuals to their original location. **Conclusion:** Despite the high reclassification accuracy, the results support the existence of a single stock with spatial structuring rather than completely distinct population units, indicating that *P. saltatrix* in this region is not homogeneous.

Keywords: fish stocks; Atlantic South-West; natural tags; truss network

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Academic Editor: João S. Carrola

Published: 22 June 2026

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Author Contributions: Conceptualization, A.T.C.; methodology, B.N., R.G.K., R.M.S. and A.T.C.; formal analysis, B.N., R.S., R.G.K. and A.T.C.; investigation, B.N. and A.T.C.; resources, A.T.C. and F.A.D.; data curation, F.A.D., R.S., F.A.D. and M.R.d.C.; writing—original draft preparation, B.N.; writing—review and editing, F.A.D. and A.T.C.; visualization, B.N., R.S., R.G.K. and A.T.C.;

supervision, F.A.D. and A.T.C.; project administration, A.T.C.; funding acquisition, F.A.D. and A.T.C. All authors have read and agreed to the published version of the manuscript.

Funding: This project was financially supported by Portuguese funds through FCT—Fundação para a Ciência e a Tecnologia, I.P., and by the European Commission's Recovery and Resilience Facility, within the scope of UID/04423/2025 (https://doi.org/10.54499/UID/04423/2025), UID/PRR/04423/2025 (https://doi.org/10.54499/UID/PRR/04423/2025), and LA/P/0101/2020 (https://doi.org/10.54499/LA/P/0101/2020).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Available upon request.

Conflicts of Interest: The authors declare no conflicts of interest.

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