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# Otolith microchemistry to assess the habitat use of *Atherinella brasiliensis* in two estuaries with distinct salinity ranges in the Northeastern Brazil

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## INTRODUCTION & AIM

**Estuary**

Essential for the life cycle of many fish species

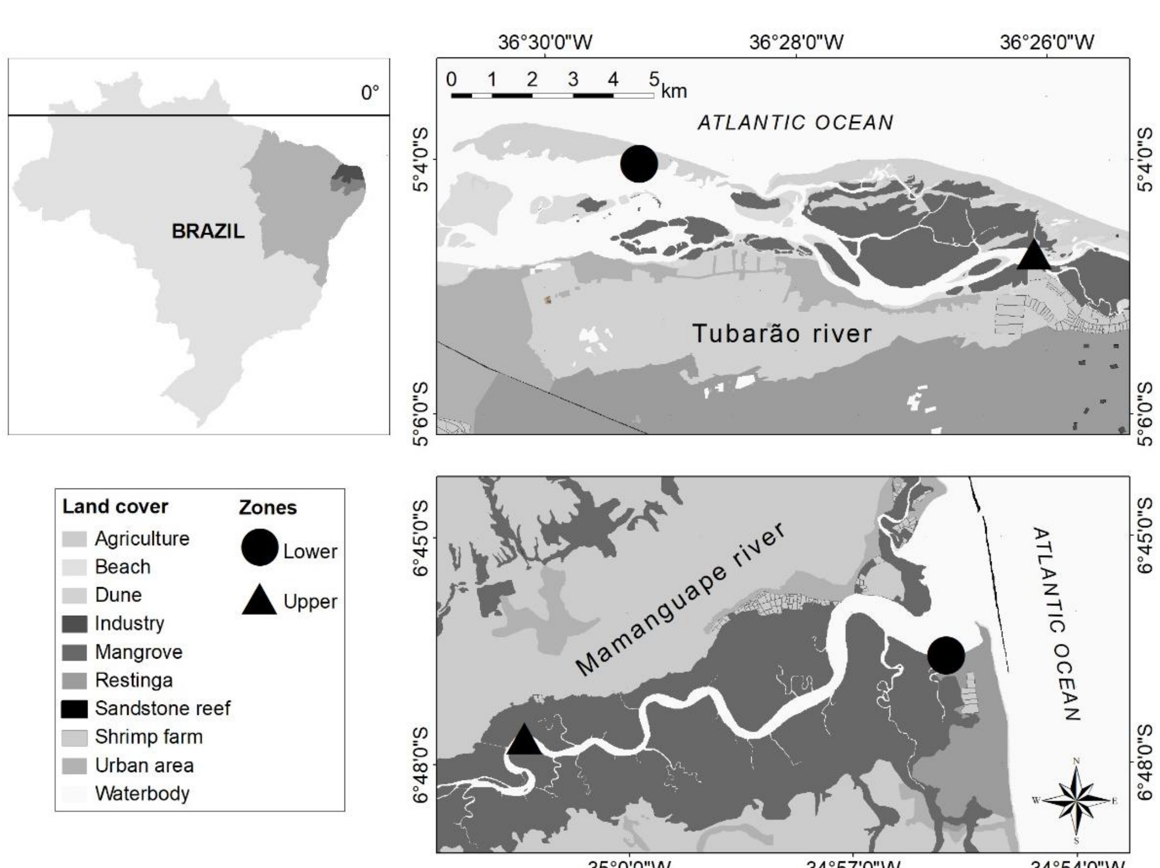
Estuarine resident

*Atherinella brasiliensis*

This study aims to determine if the elemental signatures in otoliths from *Atherinella brasiliensis* can serve as natural tags to distinguish fish from different estuaries and from distinct salinity zones (positive vs. hypersaline) within estuaries along the Brazilian coast

## METHOD

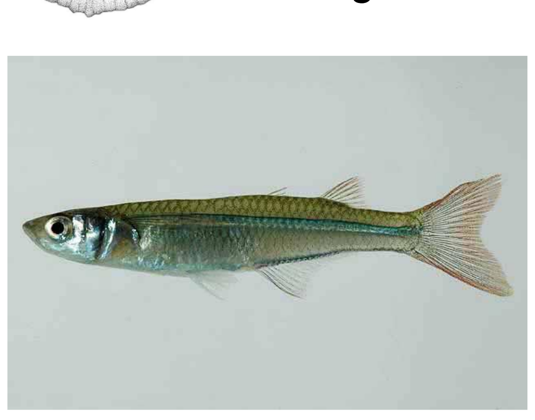
Rainy season (June and August 2016) and Dry Season (October 2016 and January 2017)




Hypersaline estuary

Positive estuary

Sagittae



*Atherinella brasiliensis*

**Otolith Chemistry**

- Decontamination
- Acid Dissolution
- Minor and Trace Elements

Ca, Sr, Mg, Ba, Cu, Fe and Zn

ANOVA

MANOVA

CAP

Cross-validation analysis Jackknife

RStudio

## RESULTS & DISCUSSION

**Between estuaries**

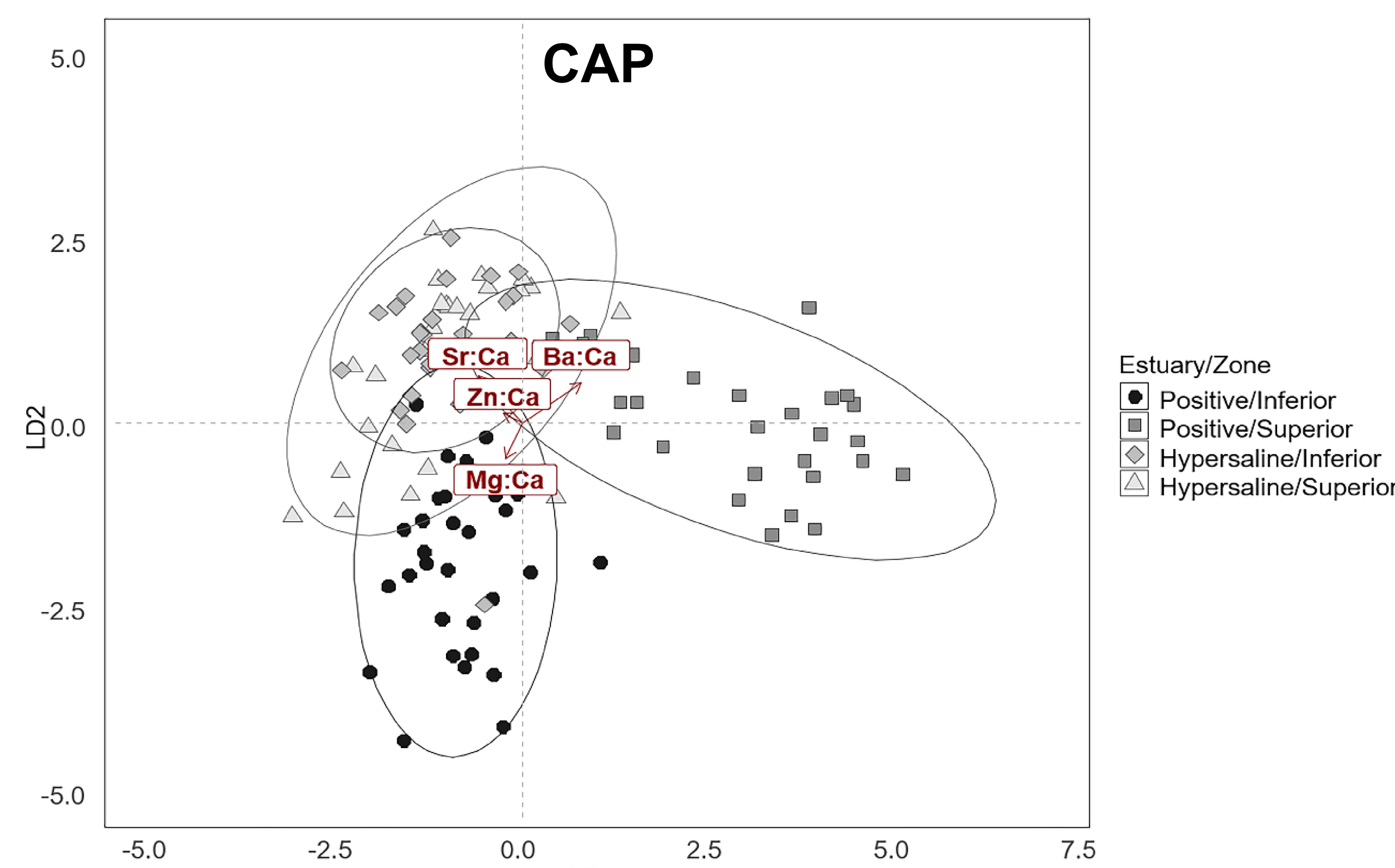
ANOVA Significant differences ($p<0.05$) → Sr:Ca, Zn:Ca, Ba:Ca and Mg:Ca

Sr:Ca, Zn:Ca — ↑ Hypersaline estuary

Ba:Ca and Mg:Ca — ↑ Positive estuary

MANOVA, Hotelling's T-Square

Pillai's Trace, $F = 14.738$; $p< 0.05$




| | | Predicted location | | | | |
|---|---|---|---|---|---|---|
| | | Positive estuary | | Hypersaline estuary | | |
| | | Inferior (n = 30) | Superior (n = 31) | Inferior (n = 28) | Superior (n = 32) | % Correct |
| **Positive estuary** | Inferior | 26 | 0 | 4 | 0 | 86.7 |
| | Superior | 0 | 25 | 2 | 3 | 83.3 |
| **Hypersaline estuary** | Inferior | 1 | 0 | 20 | 9 | 66.7 |
| | Superior | 6 | 1 | 6 | 17 | 56.7 |
| | Total | 33 | 26 | 32 | 29 | 73.3 |

**Multielemental signatures (MES) were effective in distinguishing *A. brasiliensis* populations between positive and hypersaline estuaries**

## CONCLUSION

Otolith chemistry reflects distinct drivers: riverine discharge (Ba) and aquaculture runoff (Mg) in positive estuaries, contrasted by high evaporation and tidal mixing in hypersaline environments

## FUTURE WORK / REFERENCES

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