



ON THE DISTRIBUTION OF SALINITY AND FISH SPECIES IN A CHANNEL NETWORK IN THE MEKONG DELTA, VIETNAM

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INTRODUCTION: The Mekong Delta is a large flat low-lying area with complex channel networks for irrigation and transportation by ship. The area is well-known as a major food production region in Vietnam but is under the threat of saline water intrusion. Many gates have been and are being built to prevent or minimize the impact of saline water intrusion. However, the importance of ecosystems and ecosystem services gained less attention irrespective of their capacity to provide necessary goods and services for human well-being. Therefore a series of surveys on the distribution of salinity and fish species in Ben Tre, Vietnam were conducted.

METHODS: We conducted a series of surveys on salinity and fish fauna at 81 points from October 2017 to October 2019 (Figure 1). Salinity (pss) was measured using different salinity and conductivity sensors according to sampling sites. Missing data on salinity was filled using the salinity-conductivity relationship ($SAL=0.0006 \cdot COND$; $R^2 = 0.996$) obtained in the target region. Relationship between salinity and fish abundance was analyzed and mapped over Ben Tre province in order to understand the spatial distributions of salinity and fish species.

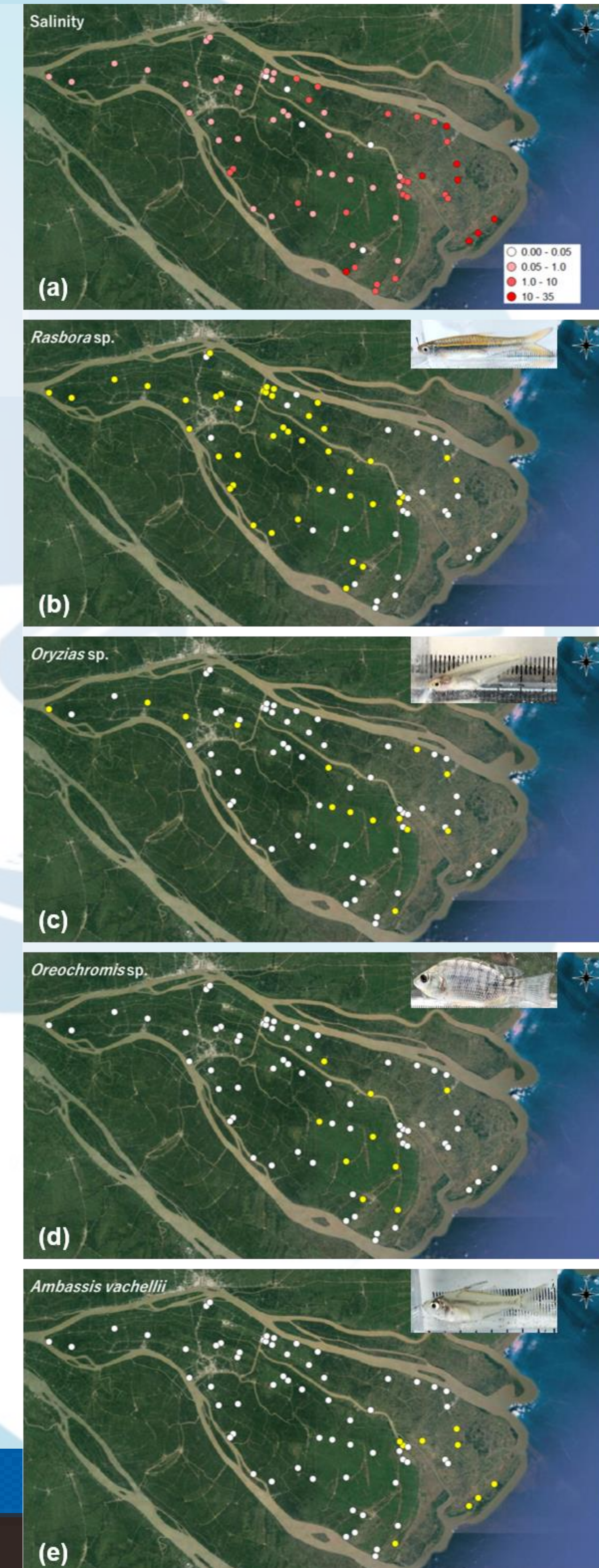
RESULTS & DISCUSSION: Salinity in the surveyed sites ranged between 0.04 and 23.33 pss with mean salinity being 2.6 pss (Figure 1a), which can be categorized into fresh- and brackish water. We observed 79 species including freshwater, brackish water and marine species (Figure 1b-1e). *Rasbora* sp. was found in various salinity conditions (up to 14 pss)(Figure 1b), while other species occurred in a specific range (Figure 1c-1e). *Oryzias* sp. occurred widely but close to main channels. This may partly because of its low swimming ability against fast flows. In contrast, *Ambassis vachellii* was found mainly in the coastal area with salinity over 10 pss. These results reflect the eco-physiological characteristics (e.g., salinity tolerance and swimming ability) of the target species. Such biological parameters should be studied for a deeper understanding of species' response to anthropogenic impacts such as gate construction.

CONCLUSIONS: Considering the impact of tidal gates and its operation, ecohydraulic conditions (i.e., water flow and salinity) around an irrigation facility needs to be considered in future research. For this to achieve, numerical simulations of water flow and salinity in small- to large-scale channels and rivers are essential, for which longitudinal and cross-sectional profiles of the rivers and channels are required.

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Figure 1. Distribution of salinity and selected fish species in the sampling locations:

- (a) Salinity,
 - (b) *Rasbora* sp.,
 - (c) *Oryzias* sp.,
 - (d) *Oreochromis* sp., and
 - (e) *Ambassis vachellii*.
- species' presences
○ its absences



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