



SPECIES COMPOSITION OF FIDDLER CRABS (BRACHYURA: OCYPODIDAE) ACROSS TIDAL FLOODING AND SALINITY GRADIENTS IN THE ITANHAÉM RIVER ESTUARY (SP), BRAZIL.

Ligia Modenesi^{1,2}; Nicholas Kriegler², Marcelo A. A. Pinheiro^{1,2}

¹UNESP, Instituto de Biociências, Câmpus de Rio Claro, Programa de Pós-Graduação em Ecologia, Evolução e Biodiversidade (PPG-EcoEvoBio).

²UNESP, Instituto de Biociências, Câmpus do Litoral Paulista, Laboratório de Biologia da Conservação de Crustáceos e Ambientes Costeiros (LBC), Grupo de Pesquisa em Biologia de Crustáceos (CRUSTA).

ligia.modenesi@unesp.br

Fiddler crabs are key organisms in estuarine ecosystems, playing essential roles such as promoting nutrient cycling in sediments. However, their distribution can be influenced by environmental factors, particularly salinity and tidal flooding. This study investigated whether these parameters affect the species composition of fiddler crabs in three zones of the Itanhaém Estuarine System (*IES*): lower (A), middle (B), and upper estuary (C). One sampling was done by estuarine zone in the summer; each zone was subdivided into contiguous 10-meter-wide bands perpendicular to the estuarine margin (A and B: 5 transects; C: 4 transects). In each transect, the flooding level was estimated based on the height of the *Bostrychietum* on tree trunks ($n = 10/\text{transect}$), and interstitial water salinity was measured ($n = 3/\text{transect}$). Additionally, quadrats (50×50 cm, $n = 15/\text{transect}$) were randomly placed per transect for crab collection, and individuals were later identified in the laboratory. Generalized Linear Models (GLMs) with Gamma distribution and log link function were used to test differences in flooding and salinity among areas. Significance was evaluated through deviance analysis (chi-square) and Tukey's post hoc test. Two PERMANOVA analyses were performed: one comparing area and another incorporating environmental variables. Flooding differed significantly among areas (GLM, $\chi^2 = 4.78$, $p < 0.001$), with similar values in areas A (35.78 ± 6.1 cm) and B (33.3 ± 3.4 cm) ($p = 0.22$), and lower values in area C (22.8 ± 7.5 cm) ($p < 0.001$). Salinity also varied significantly among all areas (A: 19.7 ± 2.3 ; B: 8.9 ± 1.7 ; C: 3.1 ± 1.4) (GLM, $\chi^2 = 20.03$, $p < 0.001$). Seven species were recorded: *Leptuca uruguayensis* (A, $n=29$), *L. thayeri* (A, $n=96$; B, $n=46$), *Minuca victoriana* (A, $n=2$; B, $n=6$; C, $n=21$), *M. rapax* (B, $n=5$; C, $n=6$), *M. vocator* (B, $n=18$; C, $n=46$), *M. panema* (C, $n=47$), and *M. mordax* (C, $n=57$), with composition differing significantly among areas (PERMANOVA, $R^2 = 0.70$, $p < 0.001$). The variables "area" and "flooding" had the highest explanatory power ($R^2 \leq 0.20$, $p < 0.001$), whereas salinity was not significant ($R^2 = 0.03$, $p = 0.18$). However, euhaline species occurred predominantly in area A, while oligohaline species predominated in area C. Although significant, flooding explains only 20% of the species variation, and other environmental variables may also influence the composition and distribution of fiddler crab species in the *IES*, reflecting specific habitat preferences.

Keywords: Environmental variables, Richness