

**ESTIMATION OF THE MEAN SEA LEVEL BASED ON POPULATION
PARAMETERS OF THE MANGROVE CRAB *Ucides cordatus* (Linnaeus, 1763):
ADVANCES IN TIMES OF CLIMATE CHANGES**

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Mangroves are coastal ecotones that provide many ecosystem services, and are generally flat and very sensitive to changes in the mean sea level (MSL). Thus, the tide level can affect the complexity of mangroves and can be used as evidence of climate change. A continuous monitoring of Brazilian *Ucides cordatus* population has been initiated due to the expected MSL rise triggered by the temperature increase. We monitored population of this species during the summer and winter of 2016–2018, in two mangroves (Juréia Ecological Station/SP, 24°26'00"S; and Superagui National Park/PR, 25°18'33"S). Within each mangrove, two zones were chosen based on the tide level (margin, higher mean high water; and 'apicum', lower mean high water). In these zones, 5x5 m quadrats were used to monitor the crabs (zones: n=18; mangroves: n=36; total: n=72). Overall, 42 parameters were recorded: 2 population parameters (density, DE; and cephalothorax width, CW), 29 abiotic (atmospheric [n=2], hydric [n=6], edaphic [n=21]), and 11 biotic parameters related to the vegetation. A multiple regression was used to find the best mathematical relationship between density (DE) and the independent parameters. The CW was not included as it was highly collinear with DE. The best model included three independent variables (F=34.56; p=0.000): tide level (FLOD in cm; p=0.000), diameter at breast height (DBH in cm; p=0.001), and air temperature (TEMP in °C; p=0.049), and was expressed by: $DE = 4.34 + 0.198 \cdot DBH - 0.0434 \cdot TEMP - 0.0667 \cdot FLO$ (n=43; R²=72.2%). A regression analysis was used to represent the relationship between FLOxDE and FLOxCW: $FLO = -16.26 \cdot \ln(DE) + 43.43$ (n=50; R²=70.9%), and $FLO = -37.18 + 1.24 \cdot CW$ (n=44; R²=70.7%). These equations can be used to support further mathematical models aiming to predict the mean sea level based on the continuous population monitoring of *Ucides cordatus*.

Keywords: body size, crab, density, mathematical model.

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