THE EFFECT OF TEMPERATURE ON LARVAL DEVELOPMENT OF CRAB SPECIES WITH COMMERCIAL INTEREST IN A CLIMATE CHANGE SCENARIO

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Climate change already affects the marine environment. One of the main effects is the increase of oceanic temperature and coastal waters. Consequently, it can affect the stability of populations and communities in the medium and long-term. In commercially exploited species, which already suffer population reduction due to anthropogenic action, climate changes tend to intensify changes on population dynamics. In this sense our aim was to assess how the ocean water temperature increase (based on different IPCC predictions) may affect the coastal environment and population dynamics, using as a model the rocky shore crab *Menippe nodifrons*, the mangrove crab *Ucides cordatus* and the estuarine swimming crab *Callinectes danae*. We evaluated 1) larval survivorship and time to molt until zoea III stage and 2) physiology (heart beating) of zoea I larvae exposed to treatments of temperature increase. We hypothesized that the survival rate will decrease in warmer water temperatures and affect the development duration and heartbeat rate. Zoea I larvae (288) from at least five females of each species were individualized in acrylic plates of 5 ml with artificial seawater (30 PSU) and submitted to three different temperatures: control (25°C), +2°C (27°C) and +4°C (29°C) until they reach zoea III stage. Temperature control was calculated based on summer sea surface average for São Paulo shelf temperature (about 1 km, at 10 m depth) from 2003 to 2016 according to the Group for High-Resolution Sea Surface Temperature. The +2°C treatment of temperature increase is based on 2046-2065 values predicted by GCMs under the IPCC scenario RCP 8.5 and 2081-2100 scenario RCP 4.5, while the +4°C treatment is based on 2081-2100 scenario RCP 8.5. Daily the zoea larvae were fed and the water was changed. Larvae survival was affected by temperature in all species. The survival rate was lower in warmer temperatures (27°C and 29°C) accompanied by reduced development time. The heart beating rate also varies among treatments in some species. These results confirm our initial hypothesis, and, in summary, if the IPCC predictions for ocean superficial waters temperature increase occurs, a reduction in colonization rate (by new offspring) and consequently in population size is expected. Therefore, our results reveal a negative effect during larval development of crab species from different estuarine habitats caused by water temperature increase.

Keywords: ocean warming, zoea larvae, estuarine ecosystems, temperature increase, *Ucides cordatus*.