HOW CAN SEASONALITY MODULATE THERMAL SENSITIVITY IN EARLY STAGES OF FUCOIDS?: THE COLDER, THE BETTER

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In the face of ocean global change, determining critical thermal thresholds for marine organisms is a key aspect to predict the survival and persistence of populations, particularly those from rear-edge areas. Seasonal variability implies acclimation of adult individuals, which might result in shifting thermal sensitivities of their recruits. In this work, we aimed to investigate the influence of natural seasonal parental acclimation on the warming response of single- and few-celled stages of *Fucus guiryi*, a monoecious fucoid from the east Atlantic coast and Strait of Gibraltar, whose populations are iteroparous. To address this, we obtained embryos from fertile thalli collected in early summer, late summer, and winter. In the three replicate experiments under laboratory-controlled conditions, we followed growth, development, survival, and photosynthetic responses of embryos exposed to control (15ºC) and warming conditions (25ºC) for 3 weeks, and initial elemental composition was characterized. Our findings revealed that breeding from winter parents possessed broader thermal sensitivity and thrived better under warming conditions than those from summer specimens, where only 50% survived and experience 75% reductions in photosynthetic rates. Nevertheless, there was a significant gain in thermal resilience from early to late summer regarding survival at 25º C. This research highlighted that warmer winters would not potentially harm new recruits, while extreme temperature events in early summer might compromise the survival of the most sensitive early summer recruits, considering the RCP8.5 predictions for 2050. The influence of parental and provisioning effects and how this might be applied to ecological restoration is discussed.