

{rokbox title=|Effect of rate of temperature change on the thermal tolerance of Atlantic bluefin tuna larvae :: Image: Authors|
thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-critical-thermal-limits-atlantic-bluefin-tuna-larvae-reglero-et-al-2026-thumb.jpg|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-critical-thermal-limits-atlantic-bluefin-tuna-larvae-reglero-et-al-2026.jpg{/rokbox}

Marta Moyano, **Edurne Blanco**, Aurelio Ortega, Fernando De la Gándara, Laia Armengol, Myron A. Peck, **Patricia Reglero**, 2026. [Critical thermal limits of Atlantic bluefin tuna \(*Thunnus thynnus*\) larvae](#)

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Abstract: There is a growing interest in understanding the thermal tolerance of ectotherms across life stages. Identifying the stages that are most sensitive can help develop more robust projections on the consequences of climate impacts to populations, as well as help guide management and conservation efforts. Here, we estimate upper and lower thermal tolerance (as Critical Thermal maximum, CT_{max}, and minimum, CT_{min}) of Atlantic bluefin tuna (*Thunnus thynnus*)

larvae. This species is an iconic apex predator that exhibits regional endothermy during the adult stage, but thermal tolerance of larvae was unknown. CT_{min} and CT_{max} were estimated in larvae grown from wild eggs under laboratory conditions. The mean ($\pm$ SE) CT_{max} and CT_{min} across all tested batches and developmental stages was 31.7 ($\pm$ 0.6) and 17.9 ($\pm$ 0.7) °C, respectively. Rate of temperature change (1.5, 3, 6, or 9 °C h⁻¹) had no effect on the thermal tolerance estimates. Similarly, CT_{min} and CT_{max} were consistent across preflexion, flexion, and postflexion larval stages. The observed high inter-individual variability in CT_{min} and CT_{max} (11-13 °C) likely reflects methodological challenges related to the extreme sensitivity of the species to handling stress and confinement. Present and future thermal safety margin (by 2060) for larvae in the Balearic Islands are 3.6 ($\pm$ 0.6 SE) °C and 1.8 ($\pm$ 0.6 SE) °C, respectively. Future research should continue exploring alternative methods for estimating thermal limits and incorporate experimental designs with multiple stressors such as exposing well- and poorly-fed larvae to heatwaves and/or different light levels.

Keywords: Early life stages of fish, Thermal tolerance, Thermal safety margin, Heatwave,

Climate change