

Peer Review

Review of: "Effects of experimental CO₂ enrichment on the PSII photochemical efficiency of *Symbiodinium* sp. in *Acropora millepora*"

Hany Akeel Al-hussaniy¹

1. University of Baghdad, Iraq

This is a technically detailed and carefully executed experimental study on the effects of CO₂ enrichment on PSII photochemical efficiency of *Symbiodinium* sp. in *Acropora millepora*, and it is commendable for its rigorous carbonate chemistry control, high-frequency PAM measurements, and transparent reporting of inconclusive outcomes. The strengths include precise pCO₂ manipulation, diel-resolution fluorescence monitoring, appropriate use of nested ANOVA, and thoughtful discussion of acclimation and chlororespiration mechanisms. However, the study is limited by low biological replication (n = 3 fragments per experiment from a single parent colony), potential pseudoreplication across consecutive experiments, relatively short acclimation time compared to documented photoacclimation periods, and interpretation that occasionally extends beyond statistically supported effects (e.g., inferred CO₂ counteraction trends). The accidental shift in PAM sensor position, while interesting, highlights sensitivity to measurement geometry and suggests the need for stricter spatial standardization. To improve the manuscript, the authors should strengthen the statistical framework (e.g., clarify independence of experimental units, consider mixed-effects modeling across experiments, report effect sizes alongside p-values), temper speculative mechanistic explanations unless directly measured (e.g., chlororespiration), expand discussion of acclimation artifacts versus treatment effects, and clearly distinguish biological trends from statistically supported findings; future work would benefit from greater replication across genotypes, longer acclimation, and direct measurements of carbon-concentrating mechanisms to more definitively resolve the influence of elevated pCO₂.

Declarations

Potential competing interests: No potential competing interests to declare.