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INTRODUCTION

Shellfish farming productivity is greatly affected by climate change. Through this study, it was possible to highlight how the welfare of Manila clam changes currently during the seasons. The data collected were cross-referenced with each other in order to assess the repercussions of climate change on the clam production chain from spat to commercial size.

METHODS

Every four months from April 2023 to March 2024, a batch of Manila clam fattened in the Goro lagoon (northern Adriatic Sea, Italy), was collected and analyzed in university facility in order to evaluate the welfare and growth performances through biometric parameters during the seasons and climate changes. The parameters were: the length, the weight of the soft body with which the condition index (CI) and specific growth rate were calculated. In addition, physico-chemical water parameters were monitored, like temperature, salinity, pH and concentration of nitrites, phosphates and chlorophyll-A.

RESULTS

From the results obtained, it was evident that the Manila condition index increased in July, considered the hottest season in 2023, but the values return to initial conditions in the winter season. At the beginning of spring 2024, the values reach a peak (Fig. 1). The specific growth rate in 4 months between spring and summer 2023 was higher compared to the growth until the following spring (Fig. 2).

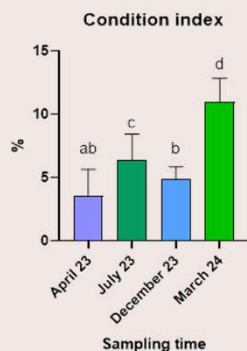


Figure 1. Condition index values at the sampling time points.

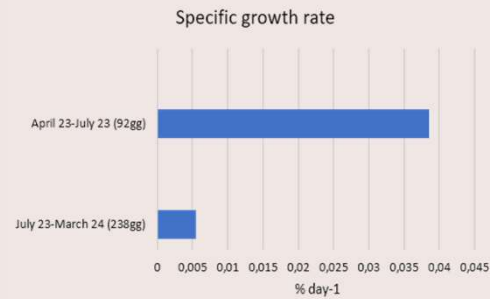


Figure 2. Specific growth rate during the summer season April-July 2023 and the following seasons until the next spring, July 2023-March 2024.

DISCUSSION

The metabolic rate of clams is reduced with low temperatures, and this has repercussions on the reduction in the pulp yield in December 2023. On the other hand, a rise in temperatures could stimulate the start of gonadal maturation that inevitably also defines an increase in CI. This could happen in March with the start of spring which led to an increase in temperatures and inevitably increased presence of microalgal in water and therefore the trophic intake for clams as filter animals. Looking at the specific growth rate, the fast growth during the first summer, in just 92 days, compared to the rest months until the next spring, 238 days, could be a proof of the rapidity with which the spat grows especially in the early and warmer seasons.

CONCLUSION

These insights are crucial for shellfish farmers, as they illustrate the dynamic relationship between climate variables and clam production and emphasize the need for adaptive management strategies to mitigate the effects of climate change on this vital aquaculture sector.



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