

Effect of rearing temperature in the growth of hatchery reared juveniles of the sea cucumber *Holothuria arguinensis* (Koehler & Vaney, 1906).

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Introduction

Holothuria arguinensis is a temperate species that can be found in the NE Atlantic Ocean, (from Senegal to Portugal) and in the western Mediterranean Sea. Being commonly found at 14 to 24°C in Portugal. *H. arguinensis* has a high economic value on Asian markets. Due to overexploitation it is necessary to stimulate the artificial production of these animals, to reduce pressure on natural stocks. Though some studies have been conducted with *H. arguinensis* there is still a wide margin for improvement and discovery.

Objective: evaluating how different water temperature conditions can affect growth of juvenile *Holothuria arguinensis*.

Materials and Methods

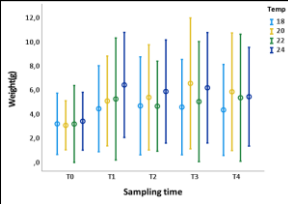
168 Juveniles of *H. arguinensis* were distributed in recirculating aquaculture systems (RAS) with aeration and filtered water. Water temperature was readjusted to the targets being, 18, 20, 22 and 24°C.

During 4 months they were fed with *Sarchorhiza polychides* and ALGAMAC 3050.

Sampling was done once per month (weight and length data collection), for biometric analysis (allometric coefficient, condition factor).

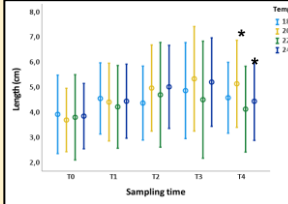


Results



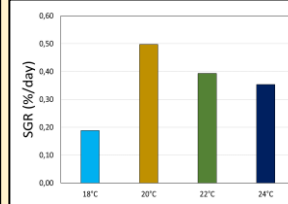
Fresh weight (mean±SD) for *Holothuria arguinensis* juveniles across the different stock temperature treatments (°C) in accordance with the sampling times (ANOVA, p>0.05).

The highest weight value was found at 20 and 18 °C. Being that no differences were found between weight values.



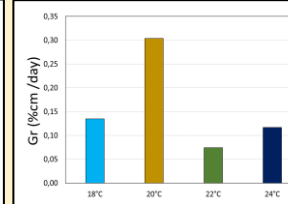
Fresh length (mean±SD) for *Holothuria arguinensis* juveniles across the different stock temperature treatments (°C) in accordance with the sampling times.* represents statistically significant differences in sampling time T4, between 20 and 22°C (ANOVA, p<0.05).

The highest length value was found at 20 and the lowest at 22°C. There were found statistically significant differences between the highest and lowest lengths.

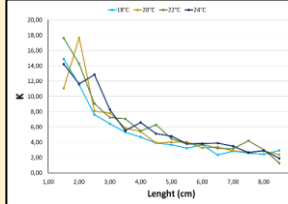


Specific growth rate (%/ day) for *Holothuria arguinensis*, relative to each temperature (18, 20, 22 and 24°C).

When analysing the weight and length data further it is possible to observe a greater increment in the 20°C treatment. Meaning that the animals grew faster in percentage in this treatment.

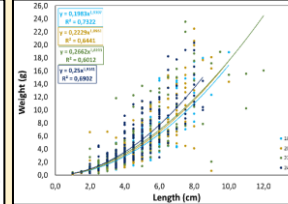


Growth rate (%cm/ day) for *Holothuria arguinensis*, relative to each temperature (18, 20, 22 and 24°C).



Fulton's condition factor (K) for *Holothuria arguinensis* juveniles, for all stock temperature treatments, according to each size class. Results are presented as mean K values.

When we observe the dispersion of the condition factor along the length values we can observe a decrease of this factor in all temperature treatments.



Allometric relationships and respective fits for *Holothuria arguinensis* juveniles for each stock temperature treatment.

The best allometric relation (b) was found at 18°C (1,93) and the worst at 22°C (1,81). The relation observed with K is deeply related with the negative allometry. Meaning that they present a greater length than relative volume.

Conclusions

This species presented the best growth at 20°C, the which is supported by the SGR and the GR and agrees with their natural temperature distribution.

Furthermore, when looking into the condition factor it is possible to see that it decreases with growth, this is in fact the result of the growth strategy observed in these animals as they have negative allometric growth. Growing more in length than in relative volume. Meaning that it might not be a functional tool when dealing with these animals.

Thus, future experiments should consider temperature intervals above 20°C and when addressing the condition of these animals, weight and length analysis (measurements, allometry) should be the best indicators of animals condition.