**Abstract for the 12th Scientific Symposium of WIOMSA 2022**

**Title:** Density and fish diet effect on rabbitfish growth in controlled systems

**Submission theme:** Marine Biodiversity, Food Safety and Security

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**Abstract**

Background

Decrease of fish stock and poverty lead small scale fishermen to deploy destructive fishing gear. In South West region of Madagascar, fishermen using mosquito seine net catch up to 50% of juvenile fish and up to 42% of these juveniles belong only to the rabbitfish *Siganus sutor*. This fishing practice certainly disturbs the structure of adult fish populations and aquaculture may be one of the effective solutions to alleviate the problem of stock depletion. Rabbitfish possesses most of the desirable characteristics for aquaculture (e.g.: herbivory and responsive to artificial food, survive in high rearing densities…) and the culture of several Siganus species (*S. rivulatus, S. canalicullatus, S. sutor*,…) have been tested in many countries. However, no study has been conducted on rearing *S. sutor* in Madagascar. Here, we investigated the possibility to develop the aquaculture of *S. sutor* regarding the growth performance of juveniles reared with different food and at different stocking density.

Methods

Post-larvae were successfully retrieved from fishermen catches in the fishing ground. Then, fish grow-out experiments were conducted in outdoor rearing tanks with an initial mean body weight of 0.75 ±0.16 g and length of 3.06±0.17 cm. The 200l rearing tanks were filled with 150l of seawater that was renewed once a day up to 80% of its total volume. Three densities (120, 320 and 520 fish/m3) were tested over a period of two months (from February to April 2022). In parallel, the performance of two fish diets was tested: an artisanal fish food (composed of fish meal, soya flour, rice bran, corn bran, cassava flour and peanut meal) and a locally produced industrial fish food (composed of corn, soya flour, wheat, vitamins, oil…). Fish were fed five times a day every two hours from 8 a.m. to 4 p.m. at 12% of fish biomass per day. Physico-chemical parameters as dissolved oxygen, temperature, salinity, turbidity and pH were recorded three times a day to explain their effect on livestock growth and survival.

Results

The industrial fish food is significantly more efficient than the artisanal one (p<0.05). We observed an increase of length and weight of 2cm and 3g for fishes fed with the industrial food and 0.85cm and 0.85g for those fed with the artisanal food. Feed conversion ratio is 1.28 for industrial food while it reaches up to 4.78 for artisanal food. Nevertheless, fish fed with industrial food represent a lower survival rate (39%). Significant difference between the three rearing densities was also observed (p<0.05) with the best growth rate in terms of length and weight observed at the tank with the density of 320 fish/m3 closely followed by the density of 120 fish/m3. The highest survival rate (66%) was observed at the density of 320 fish/m3 and the lowest survival rate (23%) was observed at the density of 520 fish/m3. Moreover, all fish in two out of four higher density tanks died after 31 and 54 days of rearing.

Conclusion

To conclude, the present study suggests the possibility of rearing rabbitfish post-larvae in rearing tank using essentially locally produced food. Controlling the rearing of juvenile rabbitfishes can be suggested as a practical approach to improve the survival rate of these juvenile fishes through sea ranching and for improving livelihood of local communities through alternative activity. A thorough study related to juvenile fish grow-out in ponds is underway leading to the development of *S. sutor* aquaculture.

**Keywords:** growth performance, *Siganus sutor*, rearing tank, food performance, stocking density.