

Improved growth performance of Nile tilapia (*O. niloticus*) juveniles using a phytogenic feed additive

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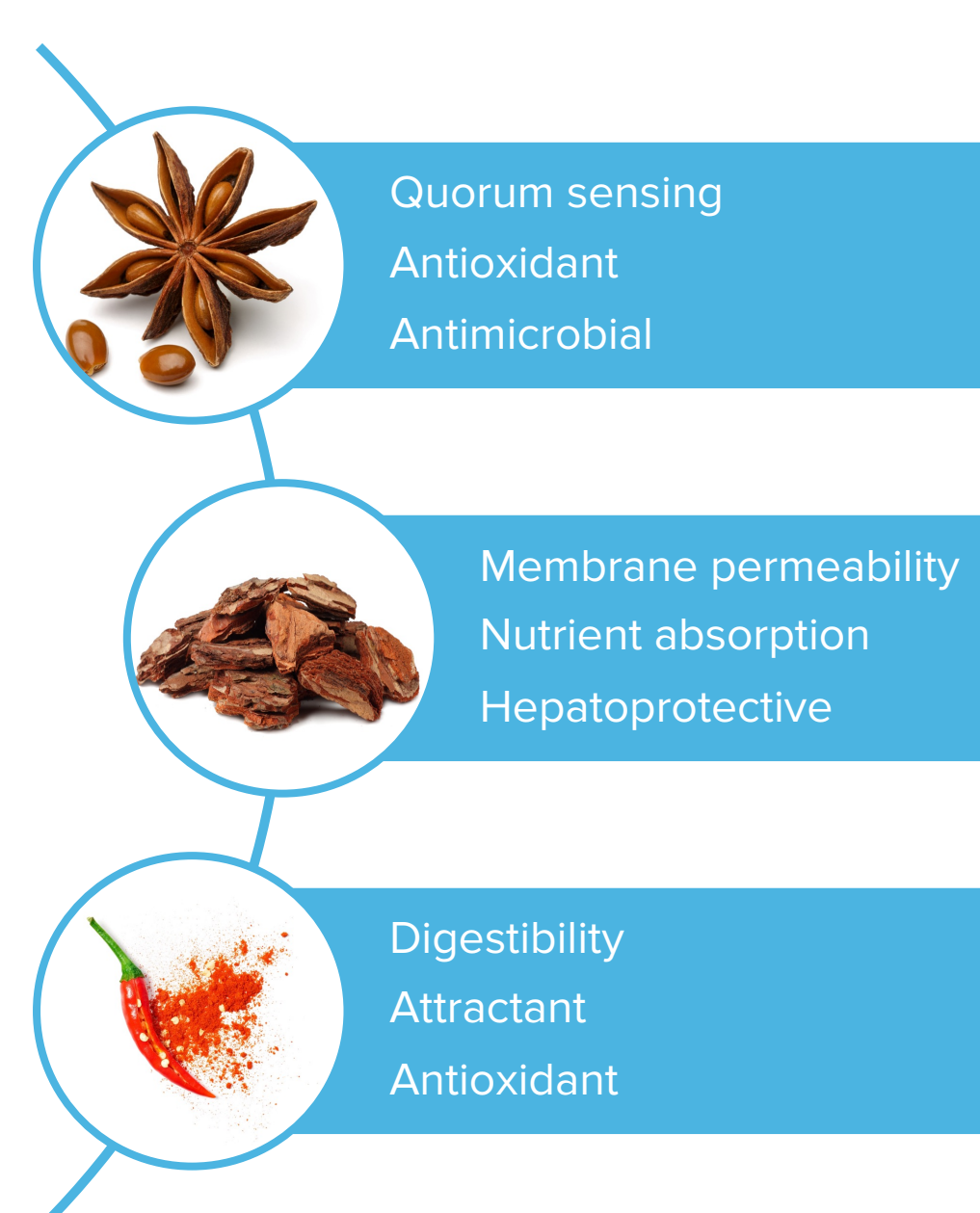
Introduction

Nile tilapia (*Oreochromis niloticus*) is one of the most aquacultured fish species worldwide, mainly due to its rapid growth performance and market potential. However, as occurs in other farmed species, growth performance, feed efficiency and disease resistance are usually challenged by stressful situations derived from common culture practices. Optimizing fish production performance is crucial for the success of the sector, where an efficient diet formulation together with a successful health and welfare management determine the best production output. As part of a proactive approach, the use of functional and sustainable feed additives, such as phytogenics, has demonstrated to be an effective tool to boost Nile tilapia performance.

Three studies were conducted to determine the efficacy of a new phytogenic feed additive on Nile tilapia juveniles' growth performance and feed efficiency.

Materials and methods

Delacon
SYRENA®
BOOST



Experiment I

Two hundred and seventy Nile tilapia of average initial weight of 3.4±0.17 g were randomly allocated into 3 groups with 3 replications for each treatment in 100 L tanks. Two inclusion rates were tested: 200 and 400 ppm. Fish were fed *ad libitum* twice daily with their respective diet for 8 weeks. Each tank was supplied with compressed air diffused through air-stones, connected to a pump keeping dissolved oxygen (DO) above 7 mg/L and water temperature at 27.7°C.

Experiment II

Three hundred and fifteen Nile tilapia of average initial weight of 7.05±0.22 g were randomly allocated into 3 groups with 3 replications for each treatment in 100 L tanks. Two inclusion rates were tested: 200 and 400 ppm. Fish were fed *restricted* feeding twice daily with their respective diet for 8 weeks. Each tank was supplied with compressed air diffused through air-stones, connected to a pump keeping dissolved oxygen (DO) above 7 mg/L and water temperature at 27.8°C.

Experiment III

Two hundred and seventy Nile tilapia of average initial weight of 13.3±0.038 g were randomly allocated into 3 groups with 3 replications for each treatment in 350 L tanks. Two inclusion rates were tested: 200 and 400 ppm. Fish were fed *ad libitum* four times a day with their respective diet for 8 weeks. All tanks were equipped with an activated biological coral filter and aeration that kept the DO above 6.5 mg/L and the water temperature at 27.9°C.

Results

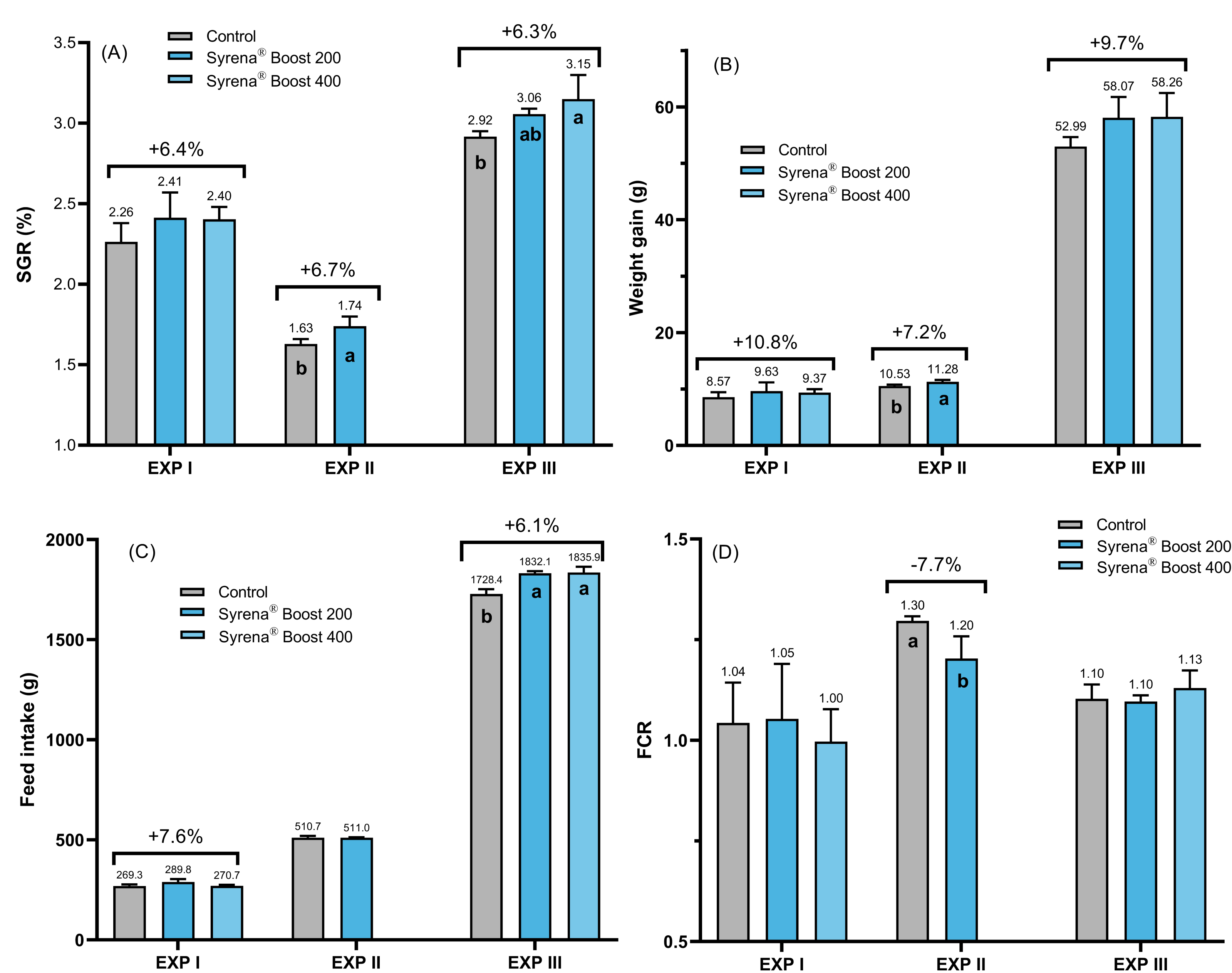


Figure 1: Nile tilapia biological and feed utilization parameters at the end of feeding trials. (A) Specific growth rate, (B) Weight gain, (C) Feed intake and (D) Feed conversion ratio. Different letters means statistically significant difference at $p \leq 0.1$.

After 8 weeks of feeding, results in the first study (EXP I) showed same fish survival between treatments being above 90%. In terms of growth performance, fish fed Syrena® Boost at both inclusion rates showed an increase in SGR at an average of 6.4% (Fig. 1A), with an increase of weight gain of 10.8% (Fig. 1B) and an increase in feed intake of 7.6% (Fig. 1C) without compromising feed conversion ratio (FCR) (Fig. 1D).

In the second study (EXP II), fish survival was also high in all treatments being above 97%. Fish fed Syrena® Boost at both inclusion rates showed a significant ($p \leq 0.05$) increase of SGR of 6.7% (Fig. 1A). Weight gain was also significantly improved ($p \leq 0.05$) improved by 7.2% (Fig. 1B) as well as FCR being significantly ($p \leq 0.1$) improved by 7.7% (Fig. 1D). In the third study (EXP III), fish survival was also high in all treatments being above 97%. Fish fed Syrena® Boost at both inclusion rates showed an increase of SGR by 6.3%, being significant ($p \leq 0.05$) at the highest dose (Fig. 1A). Weight gain was also improved by 9.7% (Fig. 1B) as well as feed intake, being significantly ($p \leq 0.1$) improved at both inclusion levels by 6.1% (Fig. 1C). No effect in FCR was observed in this experiment (Fig. 1D).

Conclusion

Overall results from the three trials clearly showed the benefit of supplementing Syrena® Boost, a specific formulation of selected phytogenics, in Nile tilapia growth performance and feed intake. Being able to optimize FCR during restricted feeding. All this supporting Syrena® Boost as an ideal phytogenic product to enhance the production profitability in a cost-effective and sustainable way.