THESIS

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APPLICATION OF BEEKEEPING BY-PRODUCT (SLUM GUM) IN FISH FEED

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Summary

In today's world, while the pressure to produce fish at a higher rate continues to mount, the existing feed resources used in aquaculture are no longer sufficient to meet the increasing demands of the food industry. Moreover, using fishmeal and fish oil as the primary sources of nutrition for farmed fish is becoming increasingly unsustainable due to the environmental costs associated with their production. The production of these resources is becoming scarcer and more expensive, which makes it uneconomical to continue relying on them. Therefore, alternative sources of nutrition, such as by-products, are being investigated to reduce the dependency on traditional feed resources in aquaculture. These alternative sources have the potential to not only maintain fish growth performance but also promote sustainable aquaculture practices, making them a promising avenue for future research in the field.

The Institute of Aquaculture and Environmental Safety at the Kaposvár Campus of the Hungarian University of Agricultural and Life Sciences was the site of the experiment, which utilized 108 self-breeding Nile tilapia fed in 200-liter tanks, with 12 fish per slot. In this study, the purpose would like to investigate the potential benefits of using slum gum as a dietary supplement for Nile tilapia.

The fish were divided into three groups, with the control group receiving commercial tilapia feed for adult fish supplemented with 160g/kg fish meal. The second diet was SG10 containing slum in 10% of the control feed, while the SG30 group had 30% of slumgum and base feed. In a day, the tilapia were fed four times with a dose equivalent to 2.5% of the biomass. The temperature of the water was around 24°C. The weight of the fish was measured at the initial and final term of the four-week experiment.

The results showed significant differences in weight gain, feed conversion ratio, protein efficiency ratio, and specific growth rate between the control group and SG30. In addition, between the control and SG10 was no significance differently. The absence of significant differences among the different treatment groups indicated similar initial measurements, final body weight, condition factor, and survival rates.

There was a 100% survival rate across all groups. Actually, replacing fishmeal with slum gum had some impacts on the growth and general health of Nile tilapia, as evidenced by the statistics results based on weight gain, and feed conversion ratio. Using by-products like slum gum could support more sustainable practices and provide cost-effective solutions for fish feed production, especially 10% slum gum concentration.

In conclusion, incorporating bee by-products, such as slum gum, into fish feed promise alternative feed that can improve growth, economic potential, and others. This alternative can also avoid the waste of more than 1500 tons of slum gum per annum in the EU, promote more sustainable practices, and reduce production costs. Further research is necessary to determine the potential of these by-products for fish feed and investigate their optimal inclusion levels in different fish varieties.