Effects of Formulated Feeds with Fan-shaped Jelly Fungus (*Dacryopinax spathularia*) Supplementation on Growth and Development of Guppy (*Poecilia reticulata*)

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Abstract

The fancy guppy (Poecilia reticulata) is one of the most popular ornamental fish species, prized for its vibrant colors and ease of breeding. The alternative protein market for aquaculture - especially for ornamental fish such as guppies - is currently expanding rapidly, with major trends emphasizing high-efficiency and sustainable sources. This study aimed to evaluate the effects of alternative protein sources (black soldier fly larvae; BSFL, red water flea; RWF) supplemented with fan-shaped jelly fungus (Dacryopinax spathularia) on growth performance, health condition, and internal organ weight of male guppies. Forties samples of male fancy guppies were divided into 4 groups: control group fed with commercial pellet (CP), 5% fungus powder + CP fed group, 5% fungus powder + BSFL fed group, 5% fungus powder + RWF fed group and feed the guppies for 60 days. Total length, caudal fin length, body weight, and survival rate were recorded. According to results of this study, it was revealed that 5% fungus powder + BSFL fed group showed the highest increase of standard length (6.3%) and the highest increase of total length (4%). While, 5% fungus powder + RWF fed group represented the highest increase of caudal fin length with 16.4%. At the end of the experiment, control group and 5% fungus powder + BSFL fed group showed the highest survival rate with 80%. It can be concluded that diets containing BSF and RWF supplemented with fan-shaped jelly fungus may serve as alternative feeds for male guppies, promoting enhanced body and caudal growth, while maintaining survival rate.

Introduction

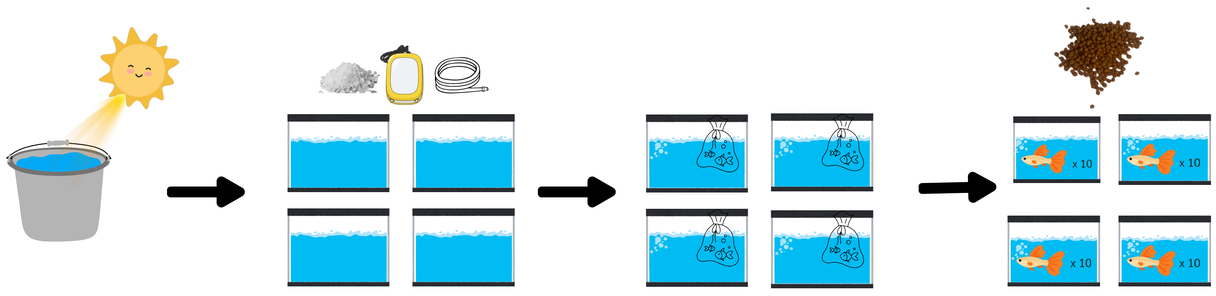
The fancy guppy (*Poecilia reticulata*) is a popular ornamental fish because it is inexpensive and easy to raise. It is widely cultured and has high market demand in Thailand and many other countries. However, commercial pellet feeds for guppies may not always provide balanced nutrition. Most pellets mainly contain plant protein, and the pellet size may not be suitable for male guppies, which have small mouths. This may reduce feeding efficiency and may cause digestive problems. Therefore, there is a need to explore alternative protein sources that provide better nutritional balance, are easier to digest, and are more sustainable for fish feed production.

Black soldier fly larvae meal has gained attention as an alternative protein source because it contains up to 56.9% protein and can replace fish meal in aquaculture diets. In addition, the fan-shaped jelly fungus (*Dacryopinax spathularia*) is an edible fungus known for its potential health benefits, including immune support and anti-inflammatory effects. It contains carotenoids, which guppies cannot produce by themselves, and also contains tannins and saponins that may help improve digestive health. However, there are still limited studies on the use of this fungus in ornamental fish such as guppies.

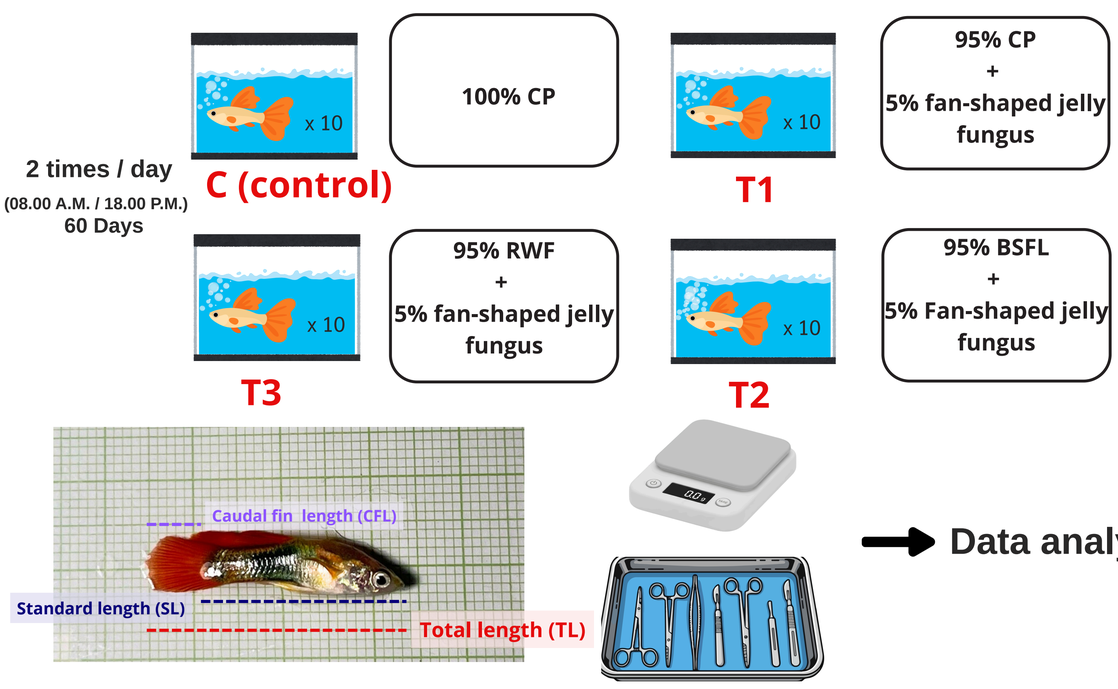
Therefore, this study aims to evaluate the potential of using fan-shaped jelly fungus (*Dacryopinax spathularia*) as a dietary supplement combined with alternative protein sources in guppies (*Poecilia reticulata*), focusing on fish health, survival rate, and internal organ condition to support better nutrition and sustainable ornamental fish production.

Methodology

Preparetion before of the experimaet



Experimental design and implementation



Conclusion

In this study, it was found that using RWF and BSFL as alternative protein sources, with supplementation of fan-shaped jelly fungus powder, improved the growth of guppies. The improvement was observed in total length, standard length, and caudal fin length. The results also showed that BSFL resulted in the highest internal organ weight in the fish. These findings suggest that BSFL and fan-shaped jelly fungus may be another alternative option for ornamental fish farmers in the future.

Results and discussion

Growth performance

Total length

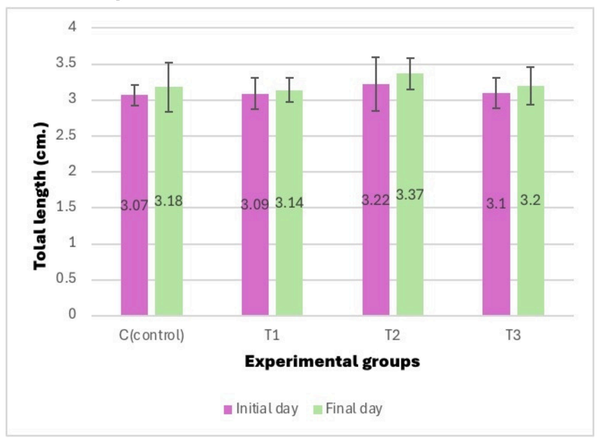


Figure 1 : Mean±SD of total length

Standard length

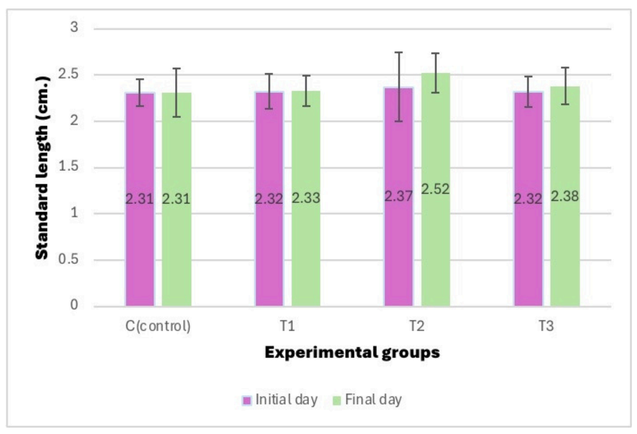


Figure 2 : Mean±SD of standard length

Caudal fin length

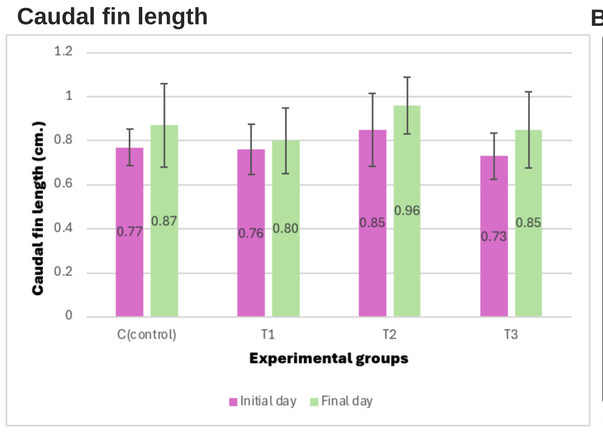


Figure 3 : Mean±SD of caudal fin length

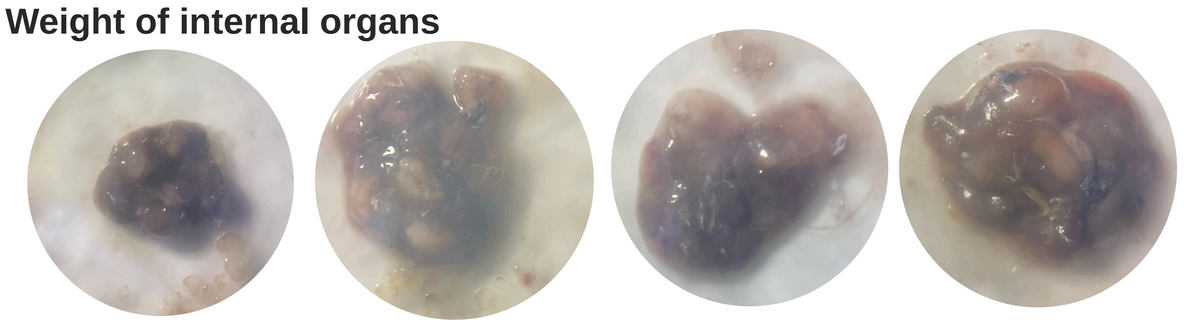
Body weight

Experimental groups	IW(g./fish)	FW (g./fish)
C (Control)	0.28 (n=10)	0.29(n=8)
T1	0.27 n=10)	0.28 (n=10)
T2	0.34 (n=10)	0.35 (n=8)
T3	0.35 (n=10)	0.35 (n=10)

Figure 4 : Mean of Body weight, IW=initial weight, FW=final weight
n = number of surviving fish

- According to growth performance, treatment 2 (T2) showed the highest increase in mean total length (4%), while Treatment 1 (T1) showed the lowest increase (1.6%).
- Interm of standard length, treatment 2 (T2) showed the highest increase in mean standard length (6.3%), while the control group showed no increase (0%).
- According to caudal fin length, treatment 3 (T3) showed the highest increase in mean caudal fin length (16.4%), while Treatment 1 (T1) showed the lowest increase.
- In term of body weight, treatment 1 (T1) showed the highest increase in mean body weight (3.7%), while Treatment 3 (T3) showed no increase (0%)

Weight of internal organs



C(control) : 0.023 g. T1 : 0.026 g. T2 : 0.029 g. T3 : 0.025 g.

Figure 5 : Average internal organ weight of guppy (*Poecilia reticulata*) at the end of the feeding trial. C = control diet; T1-T3 = experimental diets. Values were calculated from surviving fish (C and T2, n = 8; T1 and T3, n = 10)

The average weight of internal organs of surviving fish at the end of the experiment showed slight differences among the experimental groups. The T2 group had the highest average internal organ weight (0.029 g), followed by T1 (0.026 g) and T3 (0.025 g), while the control group (C) had the lowest value (0.023 g).

Survival rate

The survival rate of fish ranged from 80-100% among the experimental groups, with the highest survival observed in T1 and T3 (100%), while C and T2 showed 80% survival.

Acknowledgments

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