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Effects of Probiotics on Goldfish

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***Abstract*: This paper presents an overview on the effects of probiotics on gold fish.**

***Keywords*: goldfish, probiotics.**

1. Introduction

I think there's something great and generic about goldfish. They're everybody's first pet. ----- Paul Rudd

That is true, we all love goldfish, let us learn more about it.

The goldfish (Carassius auratus) is a freshwater fish in the family Cyprinidae of order Cypriniforms'. It is commonly kept as a pet in indoor aquariums and is one of the most popular aquarium fish. Goldfish have a lifespan averaging about 10-15 year

What are probiotics?

The term probiotic is derived from Greek and literally means "for life." It was first coined in 1965 by Lilley and Stillwell to describe substances secreted by one microorganism that stimulate the growth of another Probiotics are a combination of live beneficial bacteria and/or yeasts that naturally live in your body. Bacteria is usually viewed in a negative light as something that makes you sick. However, you have two kinds of bacteria constantly in and on your body — good bacteria and bad bacteria. Probiotics are made up of good bacteria that helps keep your body healthy and working well.

Statement of problem:

In recent years, the use of antibiotics in aquaculture has been reduced due to the diverse environmental problems that it generates in the ecosystems, as for example, the selection of bacterial strains resistant to antibiotics. The incorporation of antibiotics to the culture species, besides eliminating the pathogenic microbiota, also eliminates bacteria that are beneficial for the same organism. Consequently, the accumulation of these chemicals in the organisms is not safe for human being who is the final consumer. Commonly probiotics are used in aquaculture to increase the growth of fishes such as turbot, rainbow trout, salmon, and cod The need for increased disease resistance, growth of aquatic organisms, and feed efficiency has brought about the use of probiotics in aquaculture practices. The first application of probiotics occurred in 1986, to test their ability to increase growth of hydrobionts (organisms that live in water). My question here is when we can use probiotics in aquaculture why we can't use it test the growth of an ornamental fish such as goldfish. I love growing goldfish in my home, although its life span has been said as 10 to 15 years it dies within months even after proper maintenance and the growth is not much seen in the fish. Will probiotics have effects on goldfish?

Objective:

The objective of the study was to understand the effect of probiotic on goldfish. The use of probiotics as a dietary supplement in aquaculture of food fishes like turbot, rainbow trout, salmon, and cod to enhance both internal and external microbial environment, to increase the ·population of food organisms and to improve the nutritional level and immunity of cultured animals against pathogenic has shown promising results, but the studies on the application of probiotics as a nutrient supplement in ornamental fish in scarce. In my research I am going test three types of probiotics on goldfish and observation on the weight of goldfish every week for the period of 4 to 5 weeks. The probiotics are mixed in appropriate amount with the fish food made by me.

Dependent variable:

- Food fishes like turbot, rainbow trout, salmon, and cod

Independent variable:

- Goldfish

Controlled variable:

- Probiotics

Hypothesis:

My hypothesis on this project is

- Will the probiotics increase the growth and life span of goldfish?
- Here I am going to use 3 different types of probiotics, will all 3 probiotics give the same results?
- If not, which probiotics is going to give best results out of it?
- Will fish survive when fed with probiotics?

2. Research methodology

- To get 8 goldfish of same variety.
- Place each goldfish in a fish tank separately and mark it as A, B, C, D, E, F, G, H.
- Bought three different types of probiotics.

1) Bifilac capsules

It contains mainly Streptococcus faecalis. And some amount of Bacillus mesentericus, Clostridium butyricum, Lactic acid bacillus.

2) Yakult

It contains, lactobacillus casei strain Shirota.

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3) Sporlac

It contains, lactic acid bacillus

- Preparation of fish food in home

Ingredients:

- Spinach – 68g
- Cucumber – 68g
- Frozen peas – 68g
- Unflavoured gelatine – 134g
- Oats – 68g

Fig. 1.

Fig. 2.

How to make:

- Blanch all the vegetables and allow them to cool.
- Blend the vegetables to form a puree.
- Add the oats and blend again.
- Separate the puree in three different containers.
- Mark it as A, B, C
- Mix the probiotic in appropriate amount with the puree
    - Took 1 ml of probiotic from each type in a medicine cup
    - Diluted in water
    - Add to the puree and mix it well
    - Fish food in container A is mixed with sporlac
    - Fish food in container B is mixed with bifilac capsules
    - Fish food in container c is mixed with yakult
- In a bowl, take the gelatine and add hot water to it and mix well.
- Add the gelatine to the vegetable puree.
- Store the containers in refrigerator.
- Once it turns solid cut it into small cubes.
- Feed the fish food regularly
- See on weight of each fish every week.
- Note on the results.

Risk and Safety:

- Make sure the fish and fish tank are maintained properly.
- Clean the fish tank once the water colour starts changing.
- Do not over feed the fish.

Fig. 3.

Data Analysis:

Table 1
Week 1

	Fish A	Fish B	Fish C	Fish D	Fish E	Fish F	Fish G	Fish H
Life Span	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Weight	16.2g	17.4g	21 g	21 g	22 g	13 g	17 g	14 g

Table 2
Week 2

	Fish A	Fish B	Fish C	Fish D	Fish E	Fish F	Fish G	Fish H
Life Span	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Weight	17.6g	18.6g	20g	22g	20g	16.8g	17g	14g

Table 3
Week 3

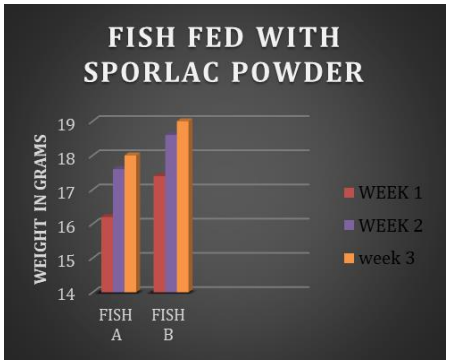
	Fish A	Fish B	Fish C	Fish D	Fish E	Fish F	Fish G	Fish H
Life Span	Alive	Alive	Alive	Alive	Alive	Alive	Alive	Alive
Weight	17.24g	19g	20.14g	22.6	20g	16g	17.3g	14g

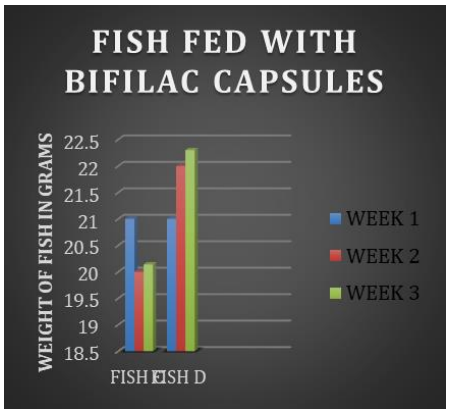
Weight of the fish is calculated by,

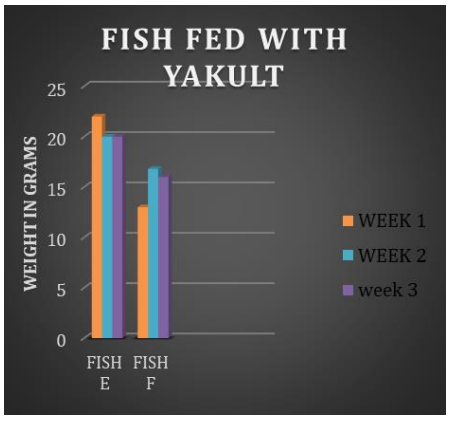
N1 = wait of the bottle + H2O

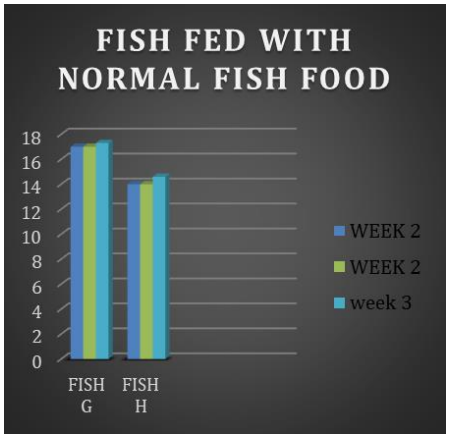
N2 = wait of the bottle + H2O + fish

N1 – N2 = wait of goldfish









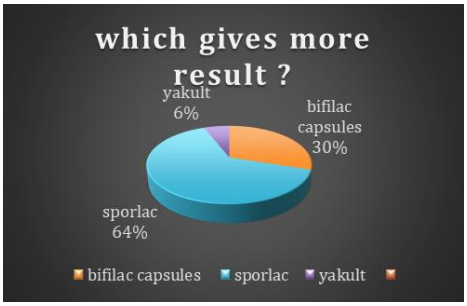
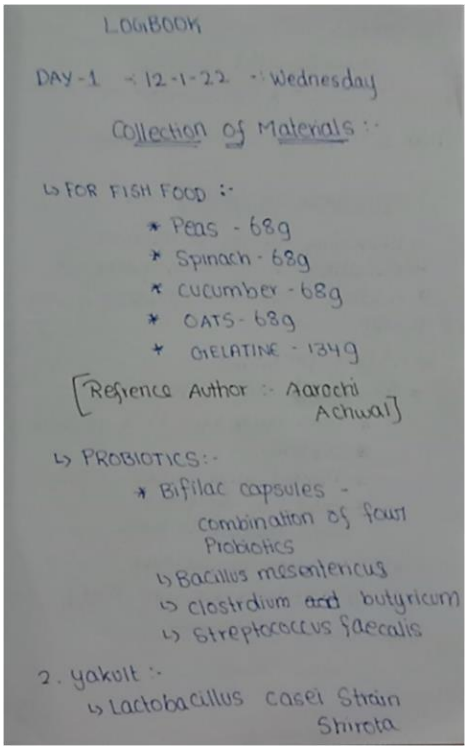


Fig. 4.


LOGBOOK

DAY-1 :- 12-1-22 :- Wednesday

Collection of Materials :-

↳ FOR FISH FOOD :-

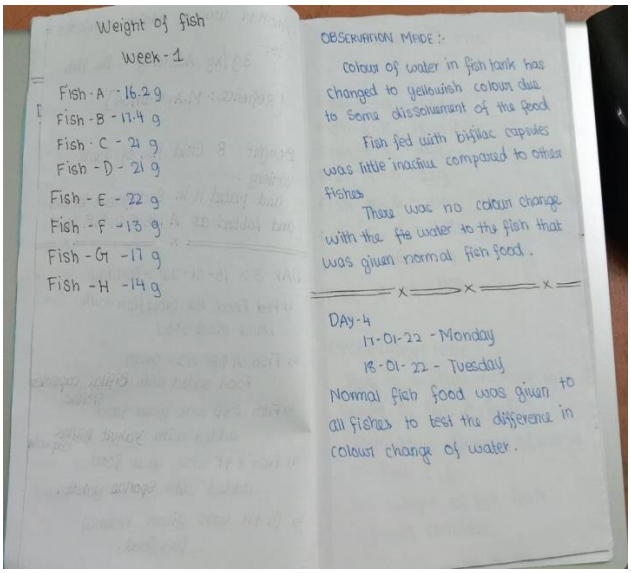
* Peas - 68g
* Spinach - 68g
* cucumber - 68g
* OATS - 68g
* GELATINE - 134g

[Reference Author :- Aarathi Achwal]

↳ PROBIOTICS :-

* Bifilac capsules - combination of four Probiotics
  - ↳ Bacillus mesentericus
  - ↳ Clostridium acid butyricum
  - ↳ Streptococcus faecalis

2. yakult :-
   - ↳ Lactobacillus casei Strain Shirota


Weight of fish

Week - 1

Fish - A - 16.2 g
Fish - B - 17.4 g
Fish - C - 21 g
Fish - D - 21 g
Fish - E - 22 g
Fish - F - 13 g
Fish - G - 17 g
Fish - H - 14 g

OBSERVATION MADE :-

Colour of water in fish tank has changed to yellowish colour due to some dissolvement of the food

Fish fed with bifilac capsules was little inactive compared to other fishes

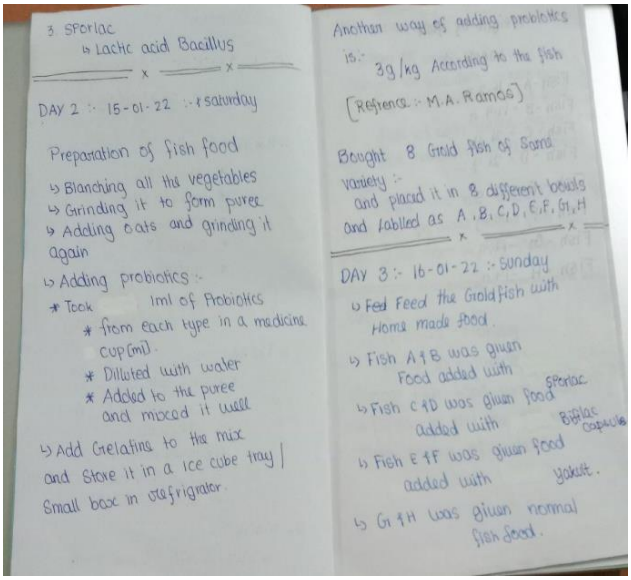
There was no colour change with the fish water to the fish that was given normal fish food.

DAY-4

17-01-22 - Monday

18-01-22 - Tuesday

Normal fish food was given to all fishes to test the difference in colour change of water.



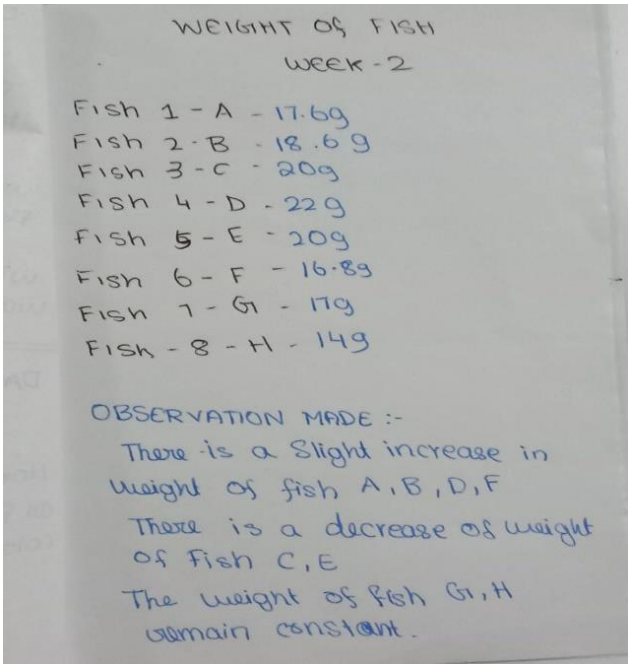


Fig. 5.

Observation:

Probiotics like those found in yogurt are not only good for people -- they are also good for fish. This research could help increase the success of raising ornamental fish to adulthood.

Homemade fish food start dissolving after 10 -15 mins leaving it in the water.

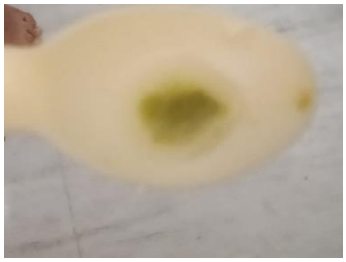


Fig. 6.

Colour of the water changes due to some dissolvement of food.

There is slight increase in weight of fish A, B, C, D.

There is a slight decrease of weight in fish C and E which was fed with bifilac capsules and yakult respectively.

The weight of fish G and H remain constant.

3. Results

From the above the research, I found It increases the survival rate and moderate increase in weight

This has proved that the probiotics have effect on goldfish

I tested three types of probiotics on the fish to check which has good results.

From the following observation I concluded that sporlac gave the best results out of all three.

This research could help increase the success of raising rare ornamental fish to adulthood. It also has implications for aquaculture, since accelerating the development of fish larvae--the toughest time for survival.

This could be also used in home and pet shops.

Answers to my hypothesis:

1. *Will the probiotics increase the growth and life span of goldfish?*

Yes, probiotics have showed increase in the lifespan and weight of the fish, this also accelerates the growth of fish;

2. *Here I am going to use 3 different types of probiotics; will all 3 probiotics give the same results?*

No, all three probiotics didn't give the same results, it varies.

3. *If not, which probiotics is going to give best results out of it?*

Sporlac gave the best results out of all three.

4. *Will fish survive when fed with probiotics?*

Yes, it survives.

Application:

Ornamental fish culture is an important component of aquaculture industry and is one of the most economic and profitable areas of fish farming activities.

This could be replacing the use of antibiotic in aquaculture mainly to the ornamental fishes like goldfish

This could also increase the survival rate of goldfishes

Those who have goldfish as pet can also feed them with probiotics as a healthy diet to their pet

Future enhancement:

- In future I should prepare the fish food in the way that it does not dissolve in the water.
- I would like to take to the next level by isolating the probiotics.
- I would also like to test the effects of probiotics in animal husbandry by giving it to chickens and other animal.

4. Conclusion

Ornamental fish culture is an important component of aquaculture industry and is one of the most economic and profitable areas of fish farming activities. The last four decades

has witnessed considerable growth and diversification in the international trade in ornamental fishes. Goldfish, Carassius auratus (Linnaeus, 1758), a member of the cyprinidae family is one of the most popular aquarium fish and are extremely valuable commercially. Goldfish are not having only attractive colour but also are hardy and easy to culture, so they make excellent aquarium species as well as laboratory species. So, the test of probiotics will help to increase its growth and survival of fish and helps in the aquaculture industry ton accelerate its growth.

Acknowledgement

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References

[1] Archana Sinha, Shubha deep Ghosh and Dharmendra Singh, "Probiotics as nutrient supplement in artificial feed of gold fish (*Carassius Auratus*)," in *Journal of the Indian Fisheries Association*, vol. 31, pp. 139-144, 2004.

[2] Anuar, N.S. & Omar, N.S. & Mat Noordin, Noordiyana & Sharifah, N.E. (2017). Effect of commercial probiotics on the survival and growth performance of goldfish Carassius auratus. AACL Bioflux. 10. 1663-1670.

[3] https://parenting.firstcry.com/articles/magazine-homemade-fish-food-recipes-to-try-today/