Project proposal

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Guppy's behavior to wavelength

Sum up

We want to study the impact of different colored lights on Guppys' behavior. Guppies are small fishes (3 to 4 cm) that typically live in fresh water. They can survive in water going from 18 to 30°C and like to play or hide in plants such as Waterweeds. In order to survive, guppies need a ration of 1 male to at least 3 females. Guppies have 6 opsins expressed for their vision, and they are highly sensitive to long wavelengths.

1

PROTOCOL

In this section, you will find the detailed protocol we attempt to follow.

2

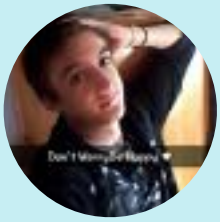
MATERIALS

In this section, you will find all the needed material for our experiment.

3

ETHICAL CONCERNS

As we are working with living creatures, you will find our ethical concerns in this section.



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Protocol

We will study Guppies' behavior when exposed to 4 different wavelengths:

- Blue
- Green
- Red
- White

The aquarium will be divided in 4 parts : a quarter of the aquarium will be exposed to white light, another one to green light, another one to blue light and the last one to red light.

First, we will put a fish in the middle of the test aquarium and let it accommodate to its environment for 5 minutes. Once the fish accommodated, we will turn on the camera and record its behavior with no light for 2 minutes. Then we will turn on the lights for 2 minutes and observe how long they spend in each zone. We will be doing the pattern light-no light 3 times, so a total of 12 minutes per fish (plus the 5 minutes accommodation time). Once we are done with a fish, we will put it back in the main

aquarium and do the experiment with another fish.

NB : the experiment will need to be performed in a dark room so the outside lightning doesn't impact on the results.

Repetition

We will do 3 repetitions for each fish, and we have 4 fishes.

Controls

We have planned to do one control: a negative one. The negative controls consisted in not exposing the fish to any light and recording its behavior.

MATERIALS

Biological setup

An aquarium Waterweed Guppy food A net A camera

Guppies - 4 (1 male, 3 females)

Electronic setup

White LED Red LED

Green LED Blue LED

IR LED An Arduino

Ethical concerns

Guppies are living creatures. We need to make sure that they are well treated and stay alive throughout our whole experiment. As stated before, they need to live in 18 to 30°C water, at a neutral pH between 6 and 8. They need plants to hide or play in. Guppies need a ration of 1 male to 3 females. Obviously, guppies need to be fed.

We will do our best to respect their needs as well as to not stress our guppies.