The change of a color sense between summer and winter

～By using a virtual medaka～

Kobe High School, Science Course, Grade 1

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Summary

It is known living things adapt themselves to the environment. Among them, we experimented how long summer and winter medaka are attracted by red, yellow, green, purple and blue virtual medaka in order to research how a color sense of medaka between summer and winter change.

Pre-Experiment

We put a medaka into an aquarium and showed virtual medaka, on a tablet PC, to it. Then, it followed and pecked the virtual medaka. Next, we showed only the background of virtual medaka and a white screen. Then, it did not react to the virtual medaka. From these test results, we found medaka is lured not by the light given off from the screen or the background but by the image of the medaka on the screen.

Experiment method

We reflected the virtual medaka which was painted with five colors on the tablet PC. Then, we observed the behavior of the medakas from the front, above and beside of the aquarium by using a video camera, and recorded the attraction of a female medaka to the virtual one (Figure 1). In this experiment, we judged the medakas which followed and pecked the virtual one as "Attracted". And we measured the proportion of the time female medaka was attracted by the virtual one to the time a female medaka was inside of the 1.5 centimeter area near the screen.

Experimental result

According to (Figure 1), summer medakas are attracted stronger by a virtual medaka whose color is yellow, blue, and purple than winter medakas.

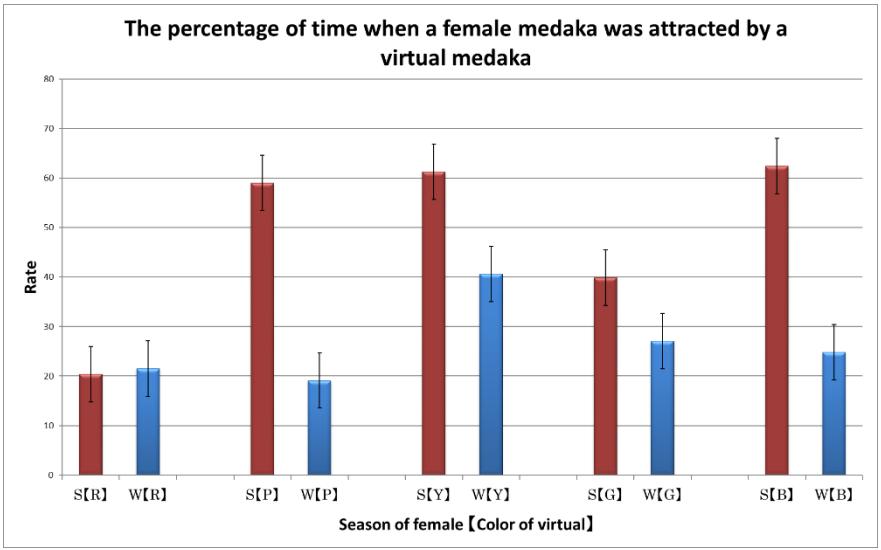

Figure 1

Discussion

Yellow: Female medaka is attracted to the yellow male medaka.

Blue, Purple: Wavelength of UV rays is similar to wavelength of blue and purple. So, in summer, medakas may avoid blue and purple's wavelength to avoid being eaten by the natural enemy.　But, a female medaka went close to them. We thought that we have some problems with the experiment method.

Therefore, we found that female medakas recognized male one in breeding season, not because of the wave of water or chemicals like hormone released by male medakas, but by color vision.

Bibliography

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