

Changes in Body Color of

Neocaridina denticulata in the Presence or Absence of Light

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Abstract

Our goal was to investigate how the body color of *Neocaridina denticulata* (*N. denticulata*) changed in different light environments. We measured body color, converted it into RGB values, and observed patterns under a microscope. Overall, individuals reared in shaded environments had lower RGB values and darker body colors, likely forming camouflage that helps them adapt to their surroundings.

1 Introduction

N. denticulata is a species of shrimp that lives in freshwater areas in western Japan. Many shrimp inhabit Ibo River that flows near our school, and we studied how the shrimp color changes in various environments were examined. Our hypothesis was that the shrimp can blend in with their surroundings; therefore, individuals kept in a shady environment would develop a darker color than normal.

2 Theory and Experiment

20 shrimp were assigned to four tanks, for a total of 80 shrimp. The body color of 80 shrimp was converted into RGB values using the app "Color Judgment Camera." On the final day, we measured their colors again. Two tanks were exposed to natural light (Tank A), and two were covered with shade sheets (Tank B).

3 Results

① Body Color Measurement

In the natural light tank, the colors were unchanged from before the experiment. In the shade tank, the RGB values of the individuals became smaller, meaning their body color became darker.

② Microscope Observation

In both groups, chromatophores were observed. Xanthophores and erythrophores from the head to the abdomen, as well as melanophores throughout the body. In Tank A, pigments were concentrated in spots, while in Tank B, pigments were diffused.

(4 Discussion)

We believe the increase in red RGB values may be attributed to the presence of dispersed xanthophores and erythrophores in the measured area. Although the area appeared blue to the naked eye, this may be because melanophores are perceived as bluish-gray when observed from a macroscopic perspective.

4 Conclusion

In this study, I exhibits changes in body color due to the diffusion of pigments in response to the presence or absence of light. However, the role of these color changes could not be clearly determined. Future studies should investigate the time difference between color change and recovery, as well as the adaptive significance of this phenomenon in *Neocaridina denticulata*.

5 References

Mahmoud, H. H. A., et.al. The lifecycle of *Neocaridina denticulata* and *N. palmata* in aquariums. *Biodiversitas*, 21(6), 2396–2402.