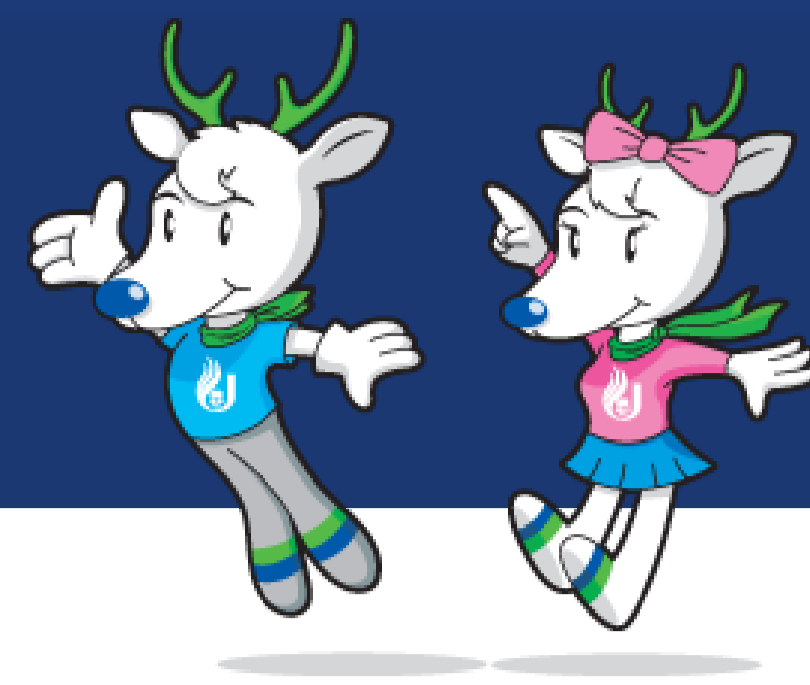


Effects of exposure of zebrafish *Danio rerio* to microfibers on adult fish and fertilized eggs during the spawning season

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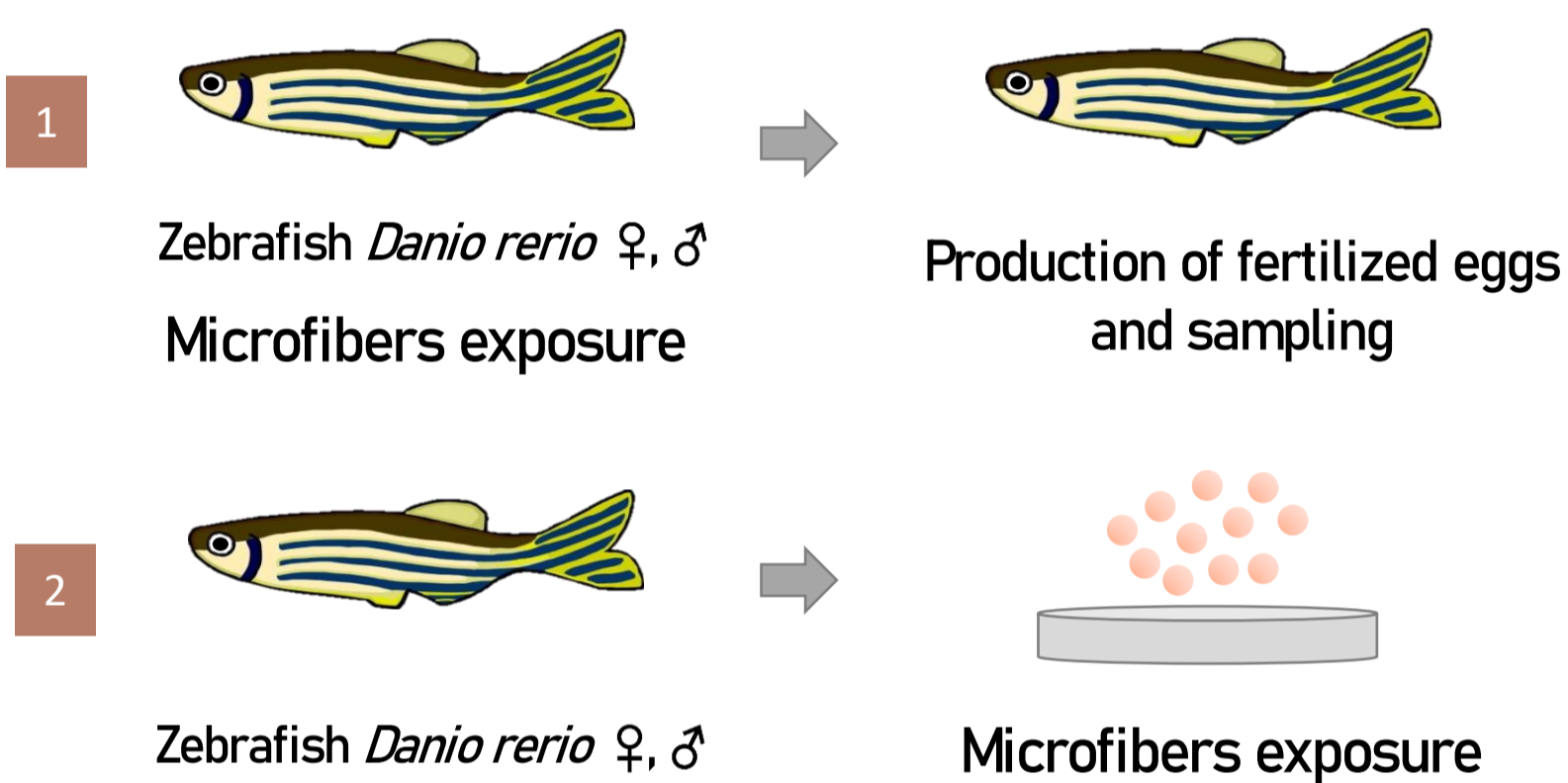
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INTRODUCTION

Microfibers are microplastic with a diameter of 5 μm or less, including polyester, nylon, rayon and acrylic. It has been reported that microfibers are the main cause of global marine pollution. Microfibers were found to be discharged into the soil, beaches and marine sediments without being eliminated in the domestic sewage treatment process. However, their potential effects on the environment and organisms are still being studied. In this study, The experiment was conducted with the ultimate objective of enhancing the current comprehension of the impact of microfibers on fish in freshwater ecosystems. We investigated the effects on the exposure of adult fish and fertilized eggs in zebrafish *Danio rerio* to polyester.

MATERIALS AND METHODS



1. Experimental Fishes were divided into control group (CON) and added microfibers group(MF). After exposure, The fishes were paired and produced fertilized eggs.
2. Fertilized eggs were produced from healthy male and female zebrafish *Danio rerio* and exposed to microfibers until hatching.

DISCUSSION AND CONCLUSION

In adult fish exposed to microfibers, GSI and HSI increased. The hatching rate, fertilization rate, egg diameter, and larval size of the produced fertilized eggs decreased. When exposed to microfibers during fertilized egg development, microfibers were observed on the surface of the egg membrane and around the mouth of hatched larvae. There was no significant difference in survival rate, egg diameter and larvae length in fertilized eggs. It is predicted that microfibers can accumulate in the body from the hatching period and cause problems in growth and development.

Additional research is needed on the effects of endocrine disruptors caused by microfibers on reproduction and the environmental toxicological effects on juvenile fish.

RESULTS

1. Results of adult fish exposed to microfibers

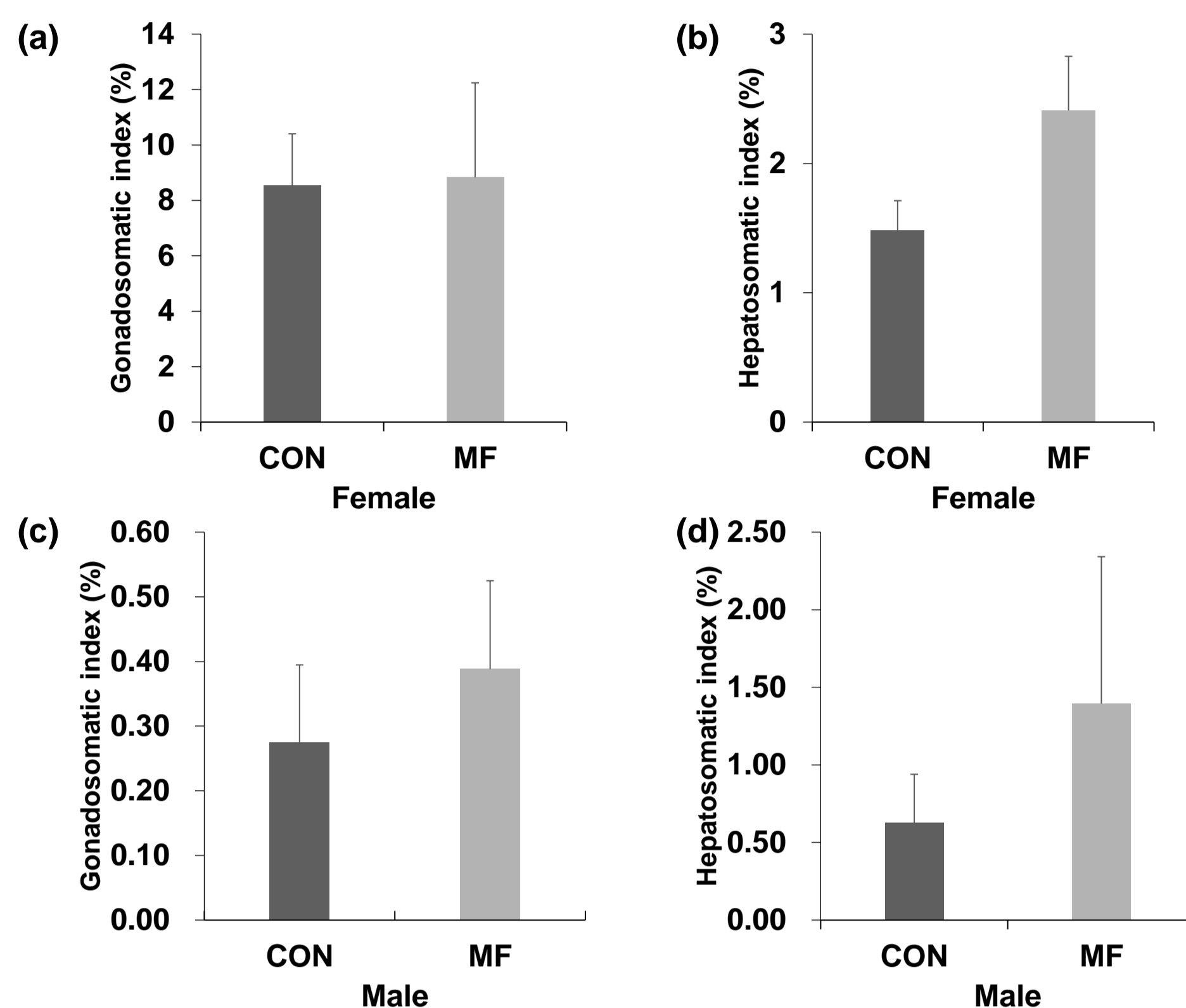


Figure 1. The results of Gonadosomatic and Hepatosomatic index in adult zebrafish *Danio rerio*. (a), (b) : female; (c), (d) : male.

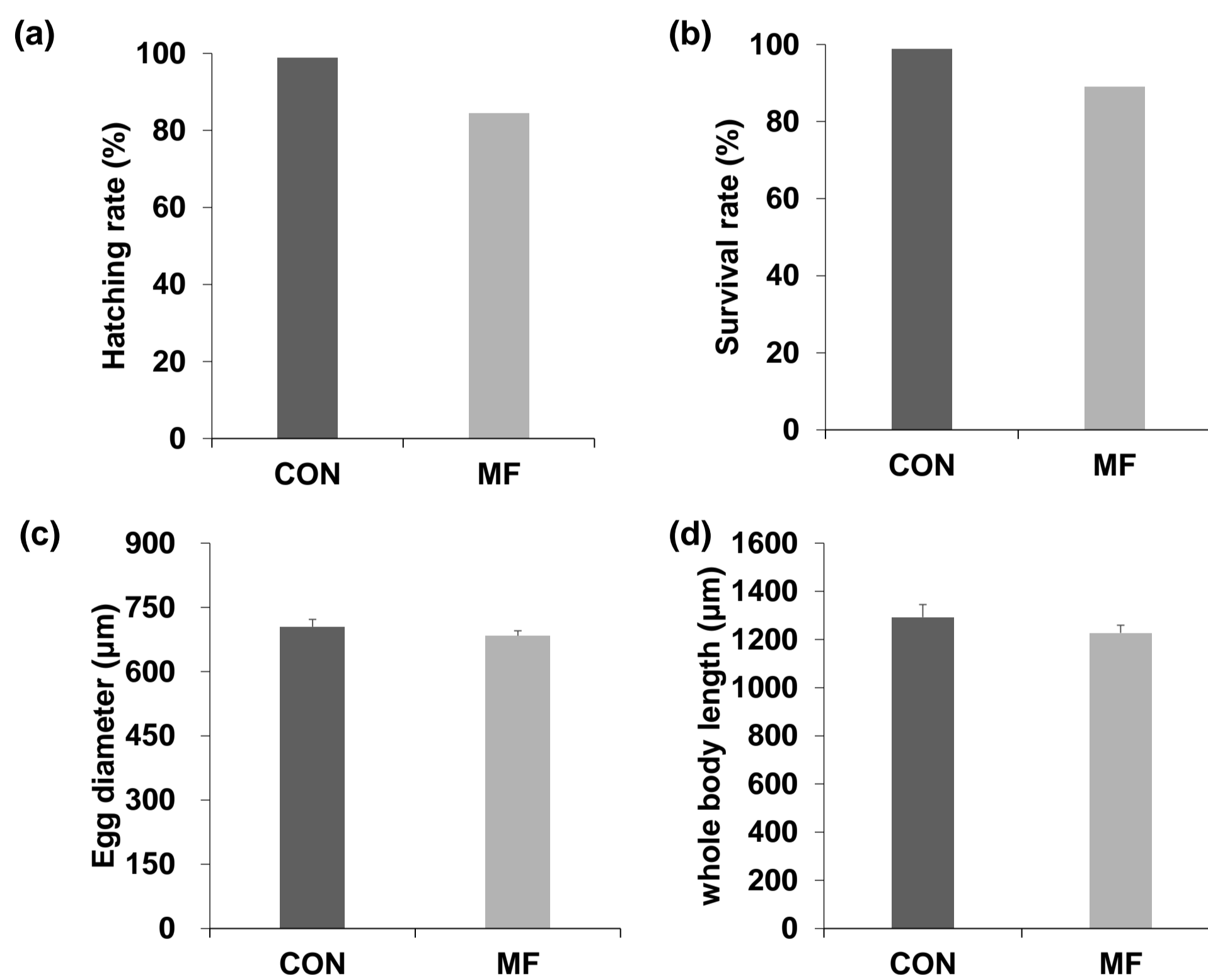


Figure 2. The results of hatching rate (a), survival rate (b), diameter of fertilized eggs (c) and whole body length of larvae (d) in zebrafish *Danio rerio*.

2. Results of fertilized eggs exposed to microfibers

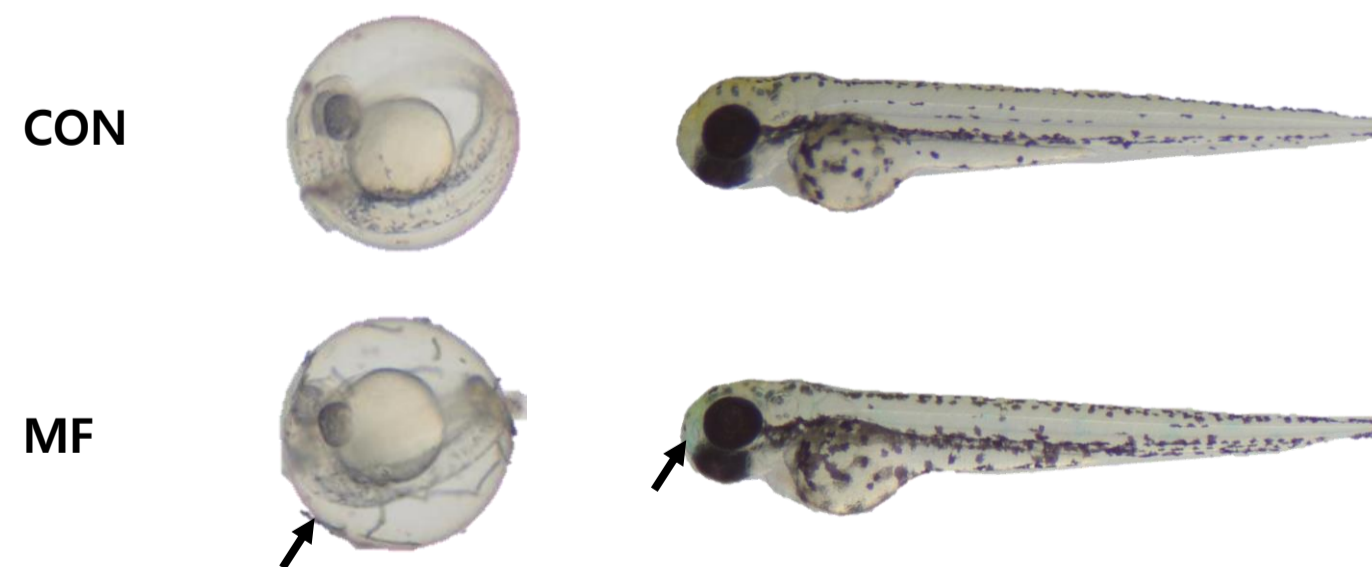


Figure 3. fertilized eggs and larvae of exposure to microfibers.

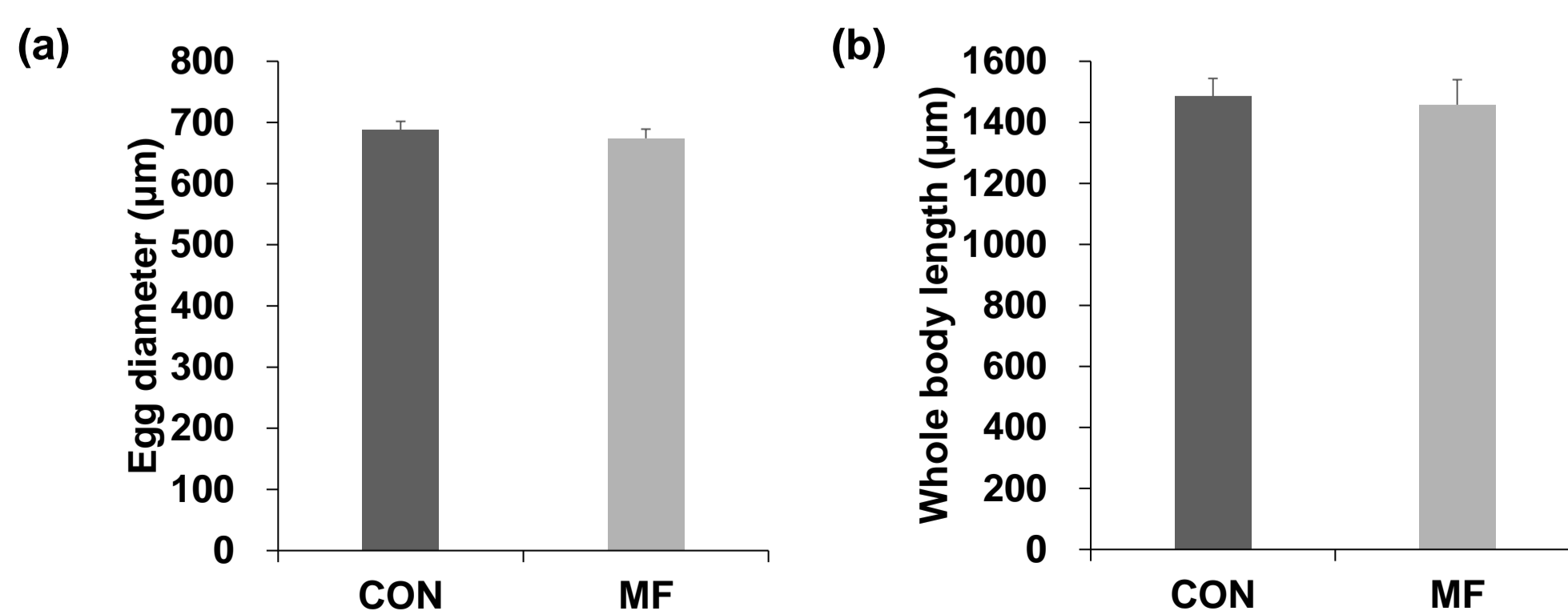


Figure 4. The results of egg diameter (a) and whole body length of larvae (b) in zebrafish *Danio rerio*.

ACKNOWLEDGEMENTS

This research was supported by Basic Science Research Program through the National Research Foundation of Korea(NRF) funded by the Ministry of Education(2021R1A6A3A0108778512).