



Microfibers in the Digestive Tract and Gills of Anchovy, *Engraulis mordax*

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INTRODUCTION

- A microfiber is a microscopic strand of plastic measuring under 5mm long
- As synthetic clothing is washed, many microfibers are discharged directly into the ocean as they are too small to be filtered out of grey water.
- Fibers are ingested by living organisms. Lowers their food consumption, reduces the energy available for the species to grow, and can lower reproduction rates.
- Species observed is *Engraulis mordax*

AIM

- Investigate and quantify the number of microfibers found in the digestive tract and gills of the Anchovy fish, *Engraulis mordax*
- It was expected that there would be more microfibers in the digestive system due to the fish ingesting more microfibers than would pass through their gills



Image of Anchovy, *Engraulis mordax*

METHOD

- Fish dissected to remove gills and digestive tract
- Mashed up organs in a mortar and pestle
- Placed both samples in saltwater for 24 hours
 - saltwater allows fibers to float to top of solution
- Samples were filtered through a filter paper using a vacuum pump
- Filter paper was examined using a microscope
 - number of microfibers were counted as well as the color
- t-test conducted to determine statistical significance

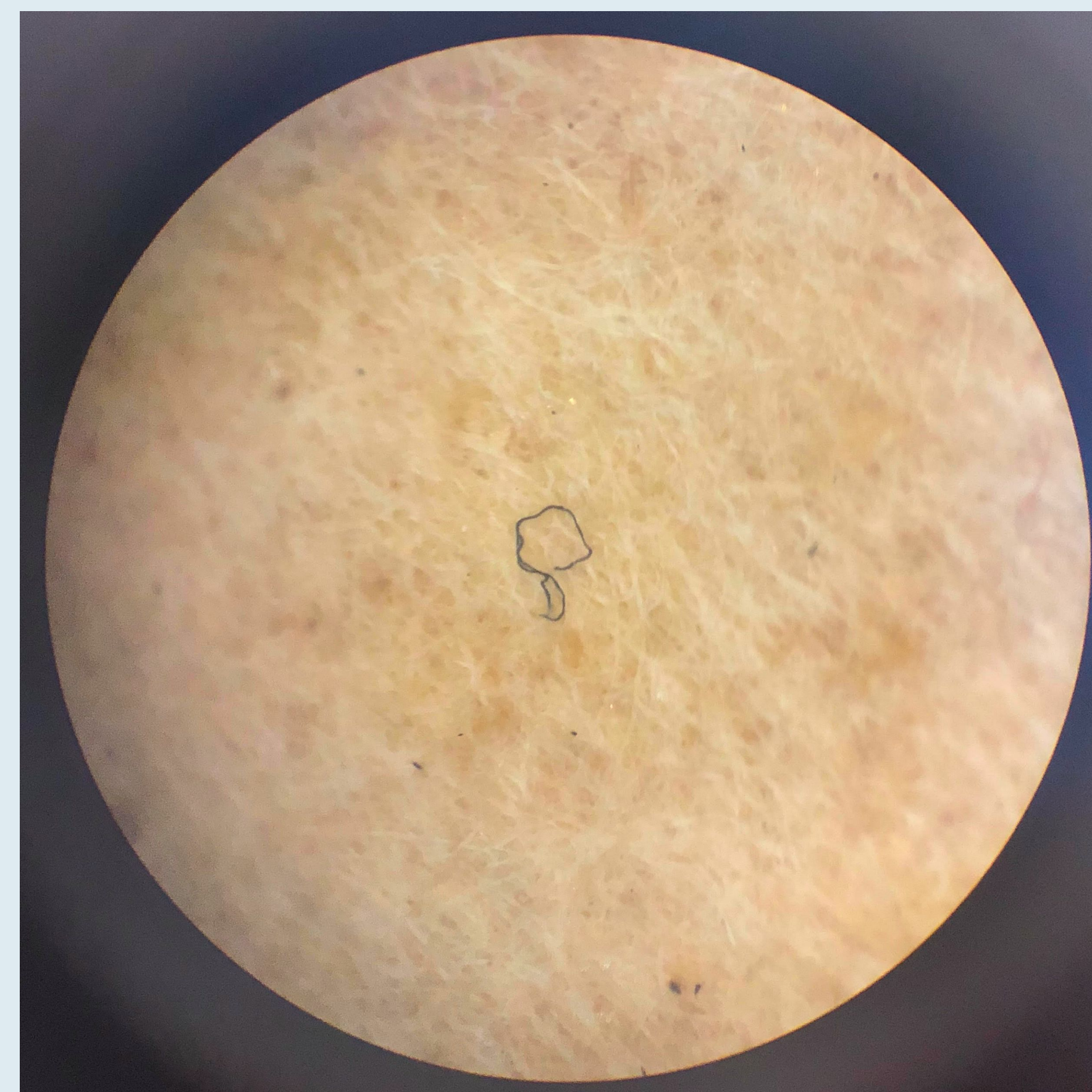


Image 1. Photograph of a single black microfiber observed on filter paper through a microscope. Microfiber found on the gut of the *Sardina pilchardus*.

RESULTS

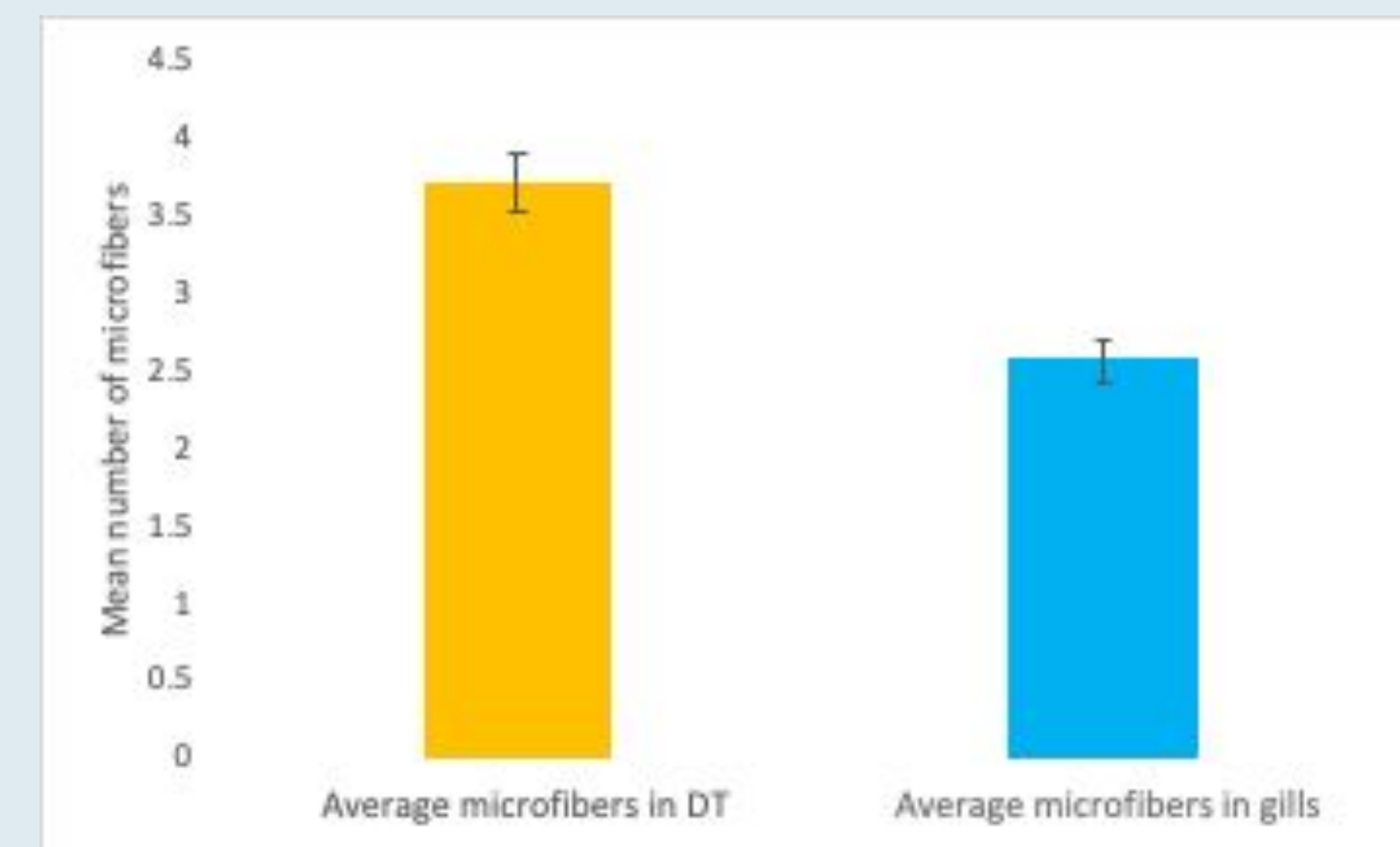


Figure 1. Bar graph showing mean number of microfibers found in the digestive tract and gills of the *Engraulis mordax*. Error bars indicate 95% confidence interval. N=100

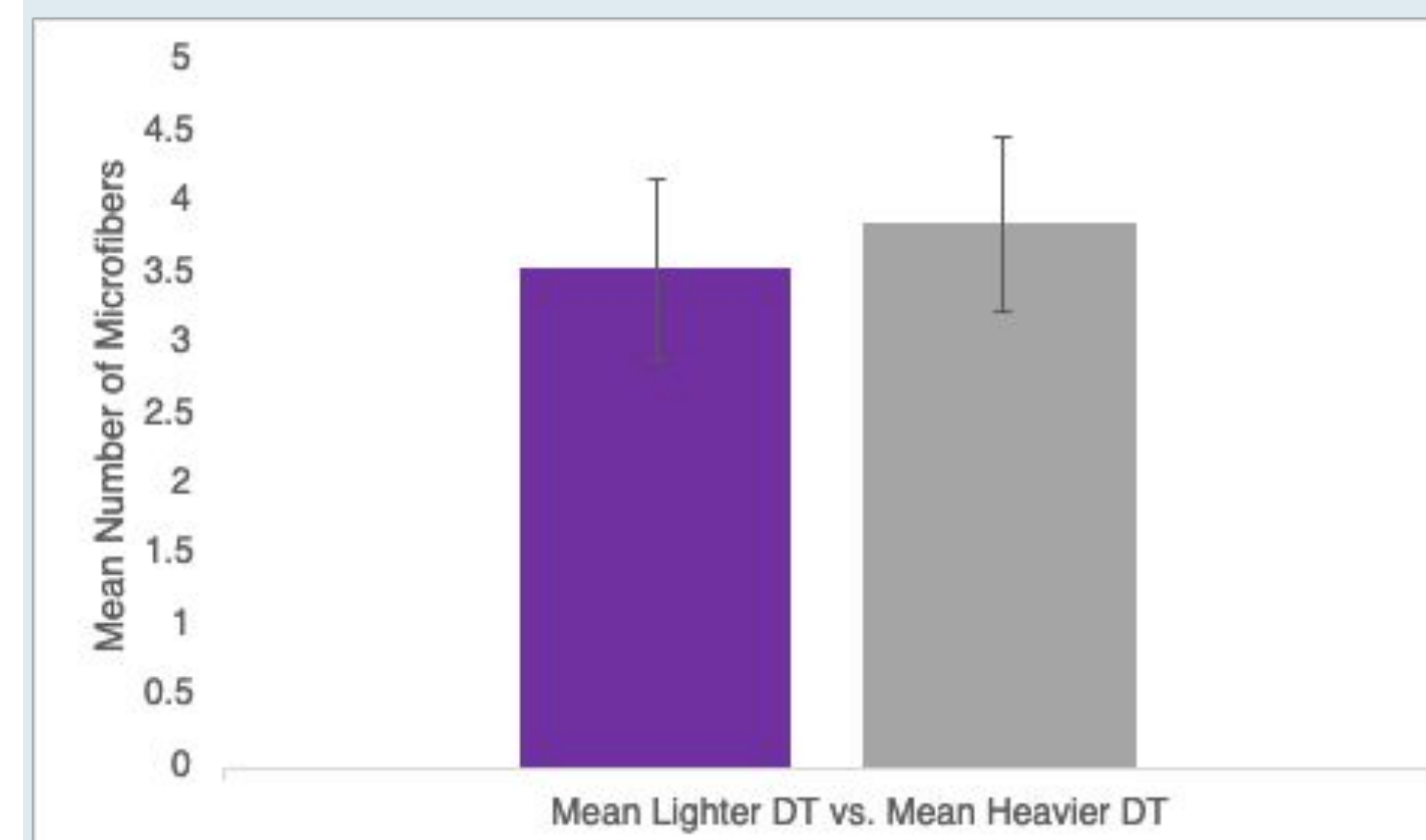


Figure 2. Bar graph showing mean number of microfibers found in the lighter weight (<0.62g) digestive tract vs. higher weight (>0.62g) of the *Engraulis mordax*. Error bars indicate 95% confidence interval. N=100.

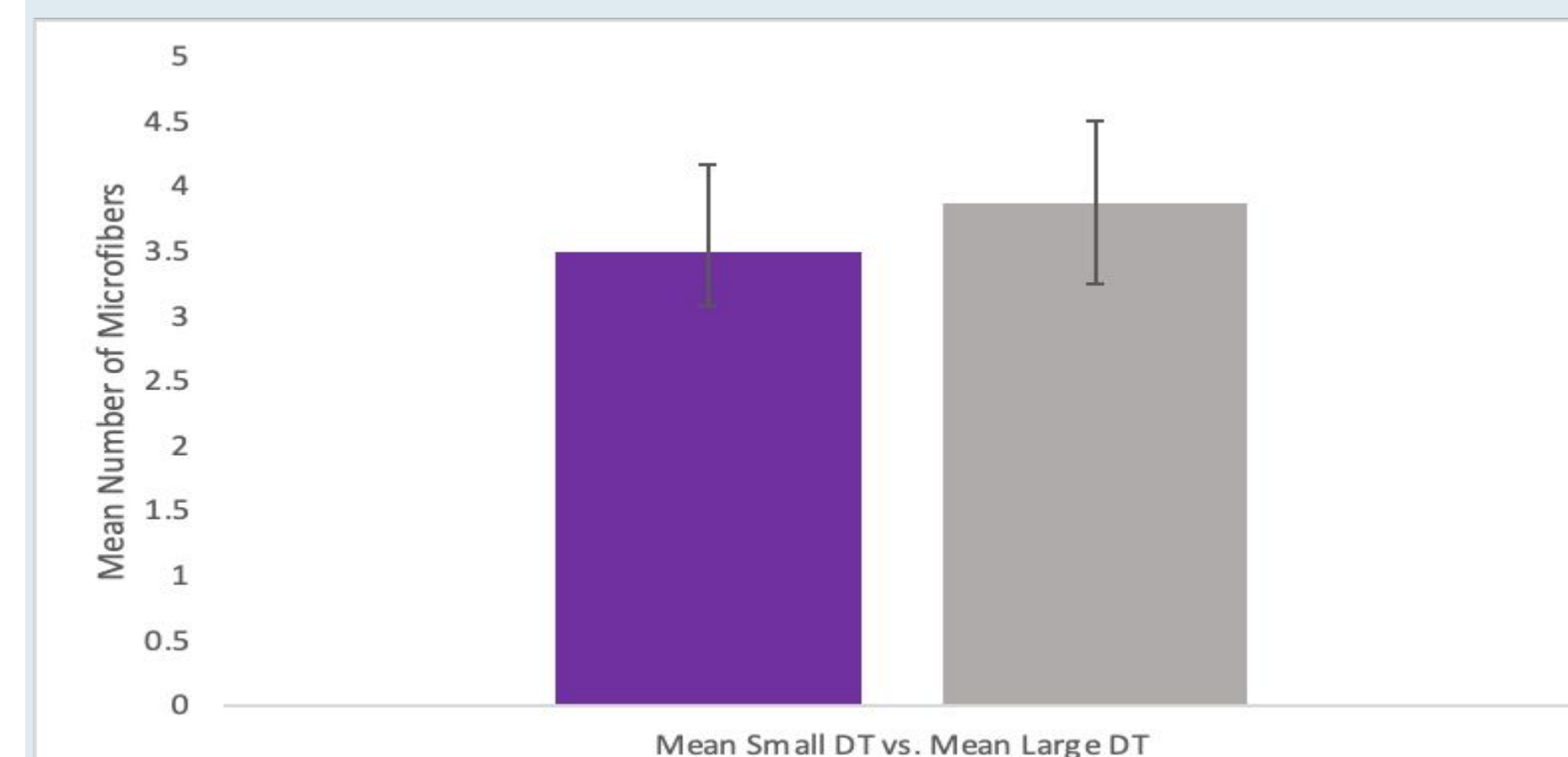


Figure 3. Bar graph showing mean number of microfibers found in the small DT (<14.68cm) digestive tract vs. larger DT (>14.68cm) of the *Engraulis mordax*. Error bars indicate 95% confidence interval. N=100.

CONCLUSION

- Statistically more fibers in the digestive tract were observed, since p-value was 0.00093 ($p \leq 0.05$)
- No statistical difference in the weight of the DT with the number of microfibers present was found.
- No statistical difference in the length of the DT with the number of microfibers present was found.
- The highest average color found in sample were black microfibers.

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