

# Microplastic Presence in California Market Squid (*Doryteuthis opalescens*) in Puget Sound



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## INTRODUCTION & PURPOSE

Microplastic is ubiquitous in the ocean environment. It is found in water, sediments, and air. Squid is an abundant food source that is consumed by many predators. These organisms are also a popular food item across many cultures and has grown in demand in the Pacific Northwest. Squid feed primarily on phytoplankton and zooplankton, thus eating microplastics passively. Microplastics have been recognized as an emerging contaminant that have the potential to impact ecosystems as well as humans.

The purpose of this study was to determine if microplastics were found in squid gills and stomachs. Squid was collected from 3 different locations across the Puget Sound (fig. 1) by line and jig method (figs. 2 & 3). Analysis of microplastics in the selected organs was done via alkaline method. Samples were then analyzed under a microscope and FTIR to confirm polymer-type.

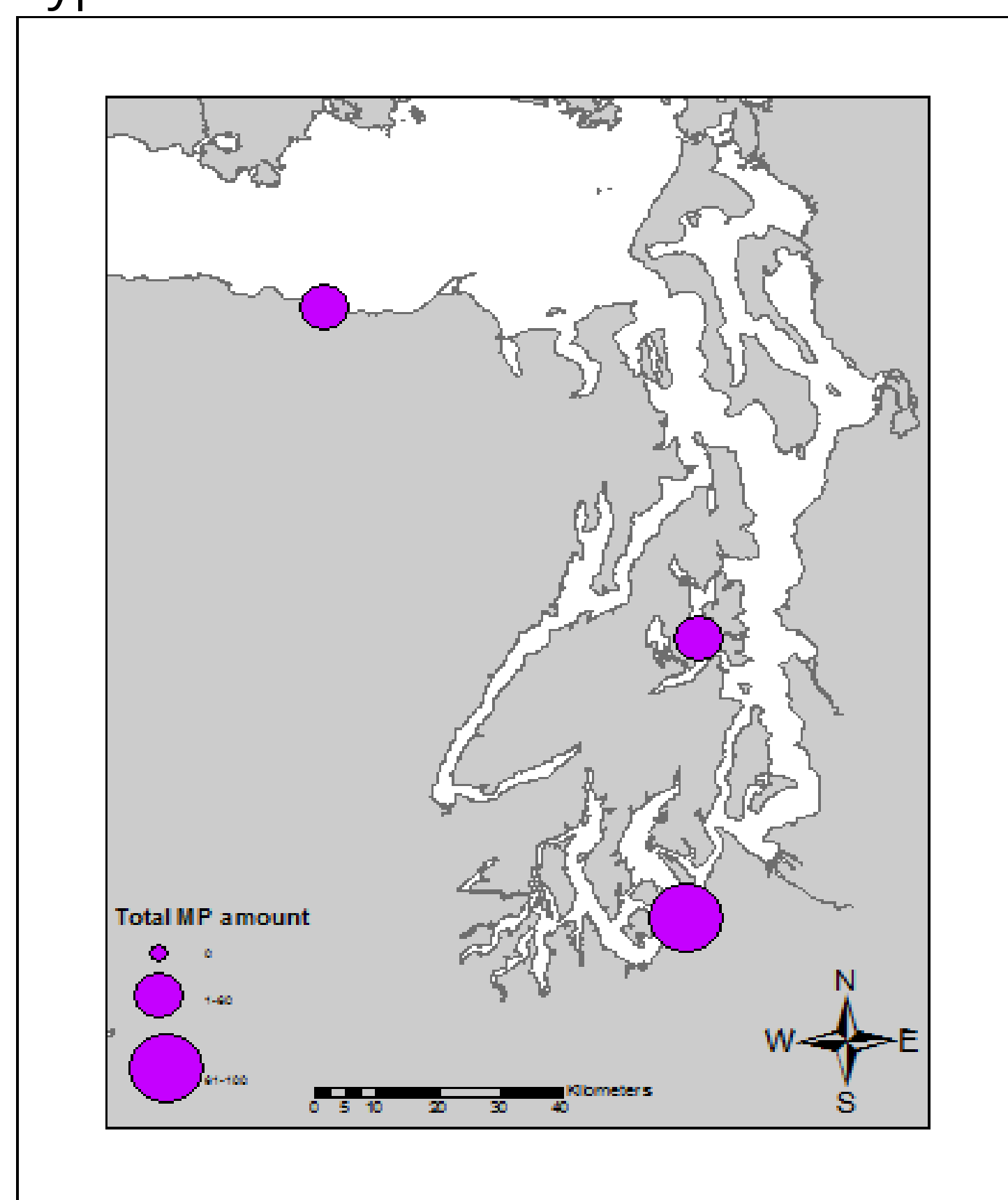


FIG 1. Map of Collection Sites

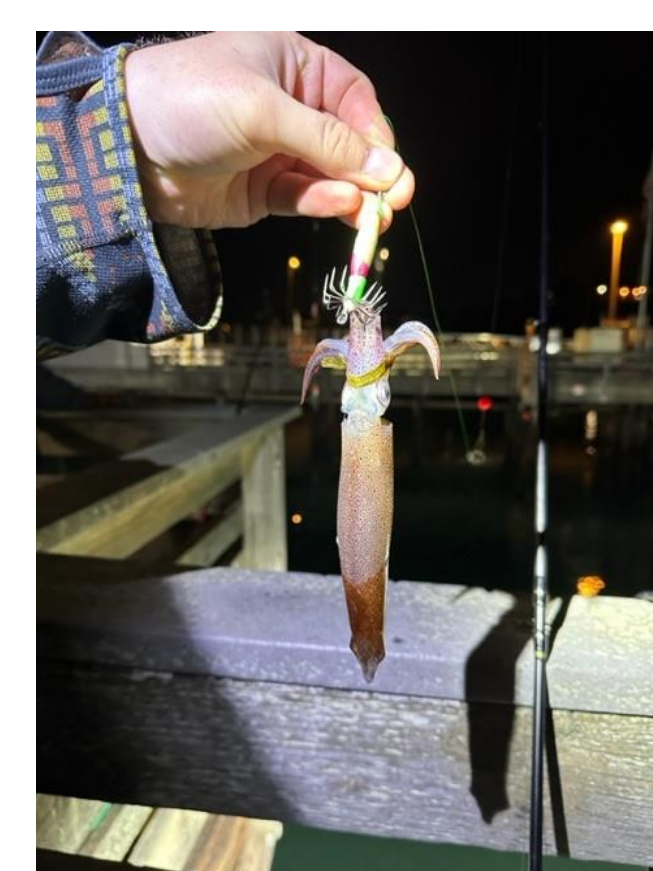


FIG 2. Captured Squid



FIG 3. Jigs Used

## METHODS

**Collection:** Squid was collected from 3 different locations (fig.1). The 3 largest squids were selected from each location.

**Dissection:** Samples were dissected, and stomach and gills were collected and stored in 4-dram vials (fig. 4 & 5). Samples were then frozen till processing.

**Alkaline Method:** Stomach and gills were dried separately in Erlenmeyer flasks at 90°C. Then 60 mL of 10% KOH were added and incubated again at 90°C.

**Vacuum Filter:** KOH solutions were cooled, then filtered through a 2.7µm pore size, and 47mm diameter filter (fig. 6). Filters were then stored in clean petri dishes.

**Microscope Exam:** Filters were placed under a microscope for visual analysis. Any microplastics found were classified (type, color, length).



FIG 4. Squid Stomach



FIG 5. Squid Gills

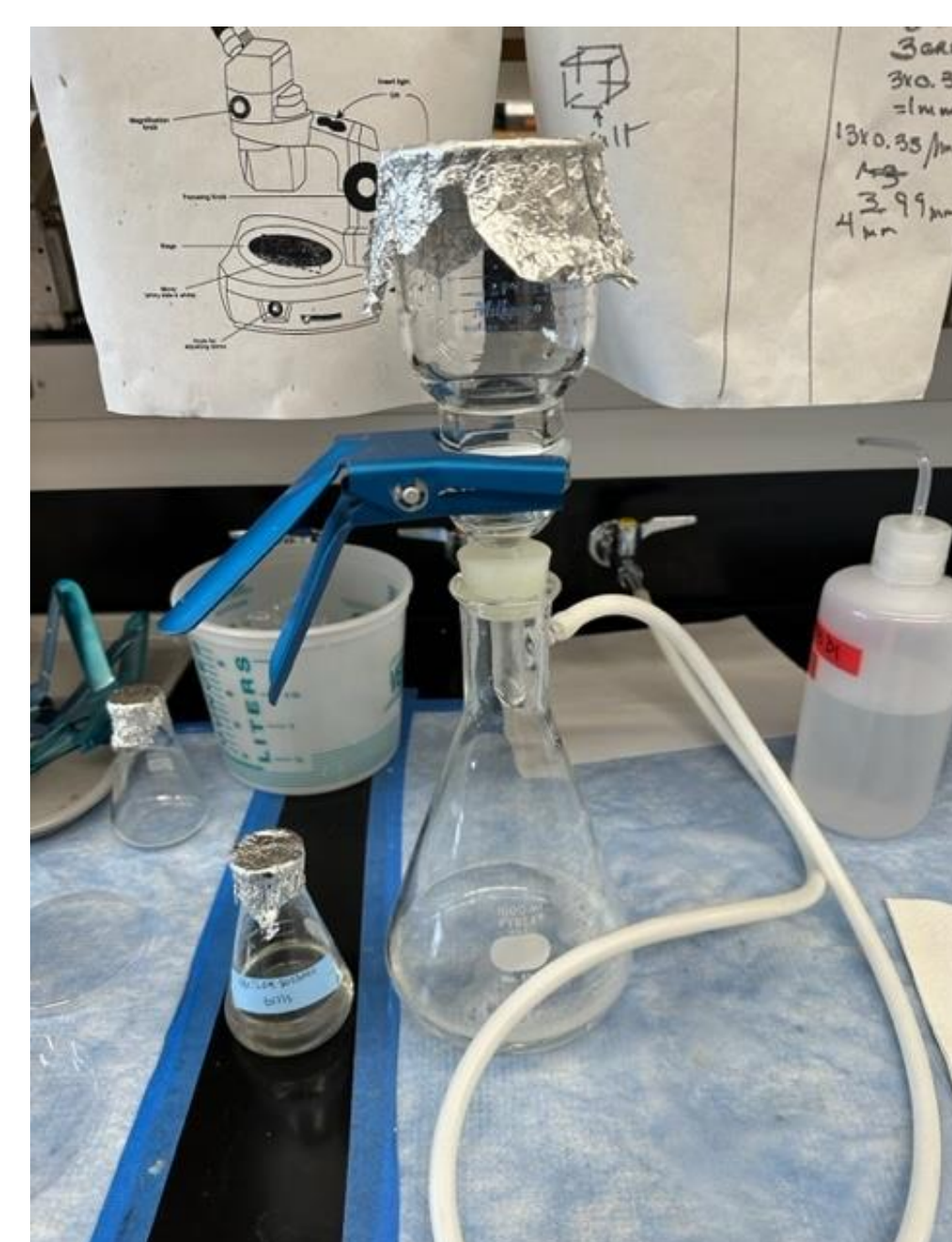


FIG 6. Vacuum Filter of the KOH Solution Containing the Organs

## RESULTS

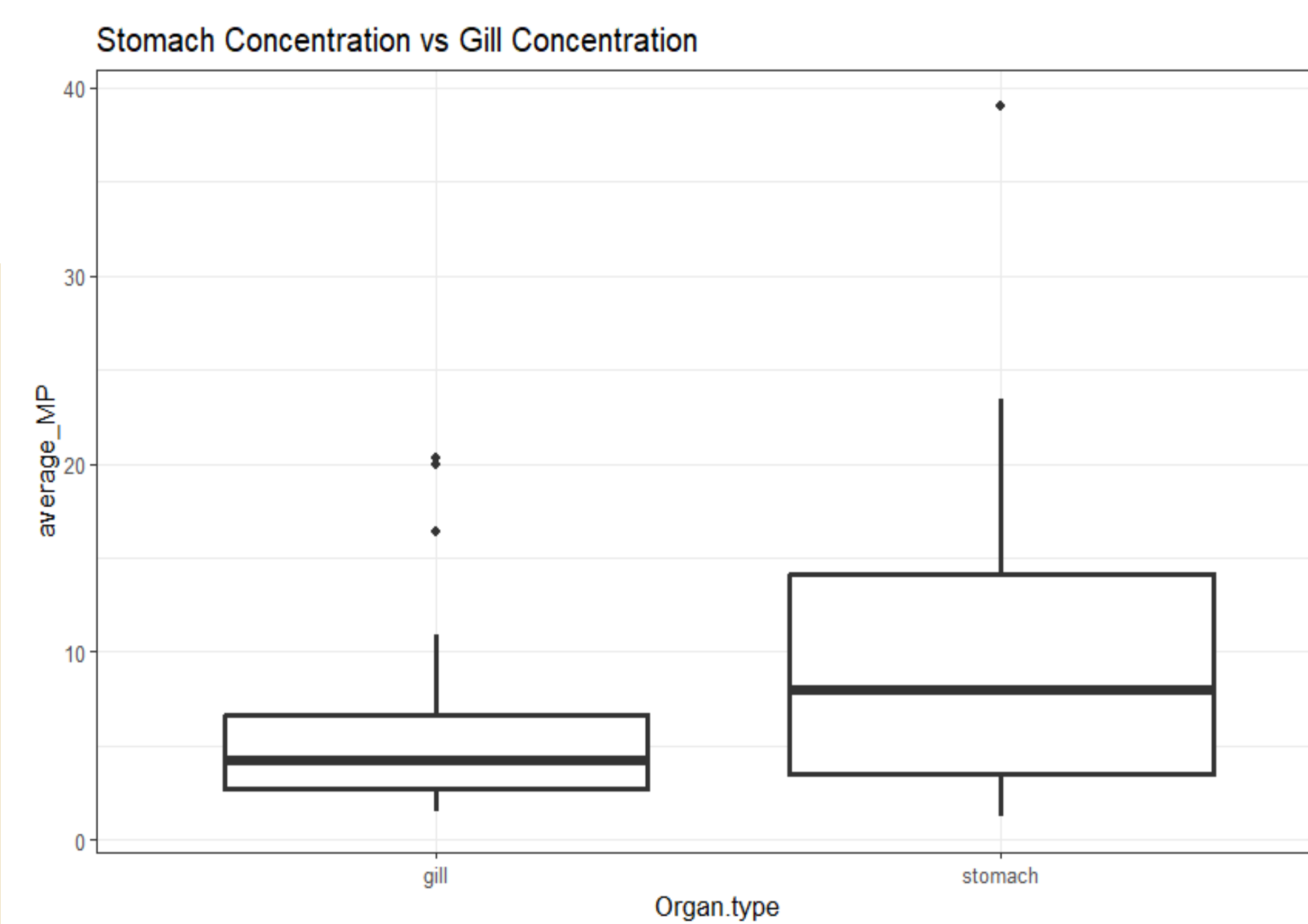


FIG 7. Stomach Concentration vs Gill Concentration

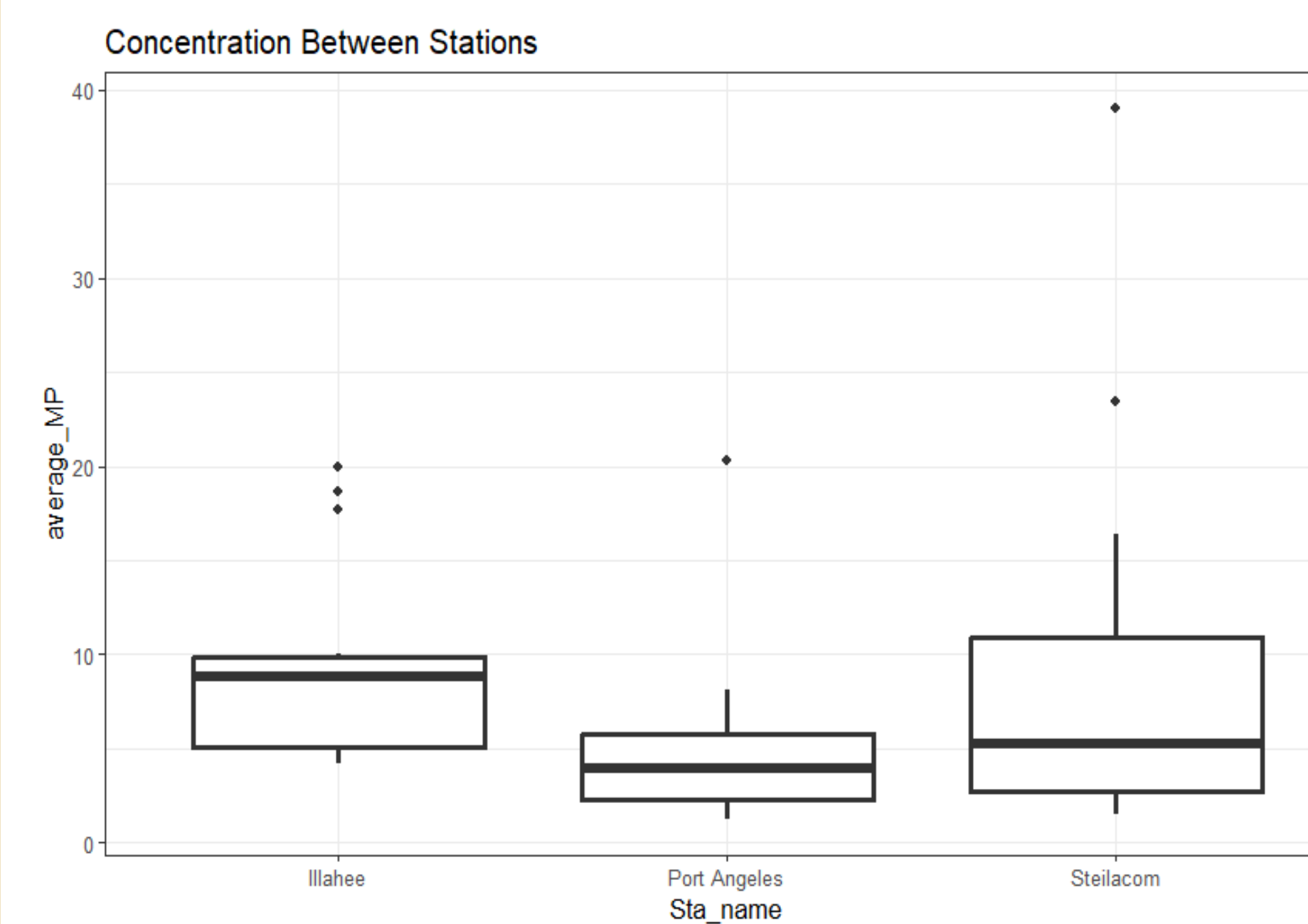


FIG 8. Concentration Between Stations

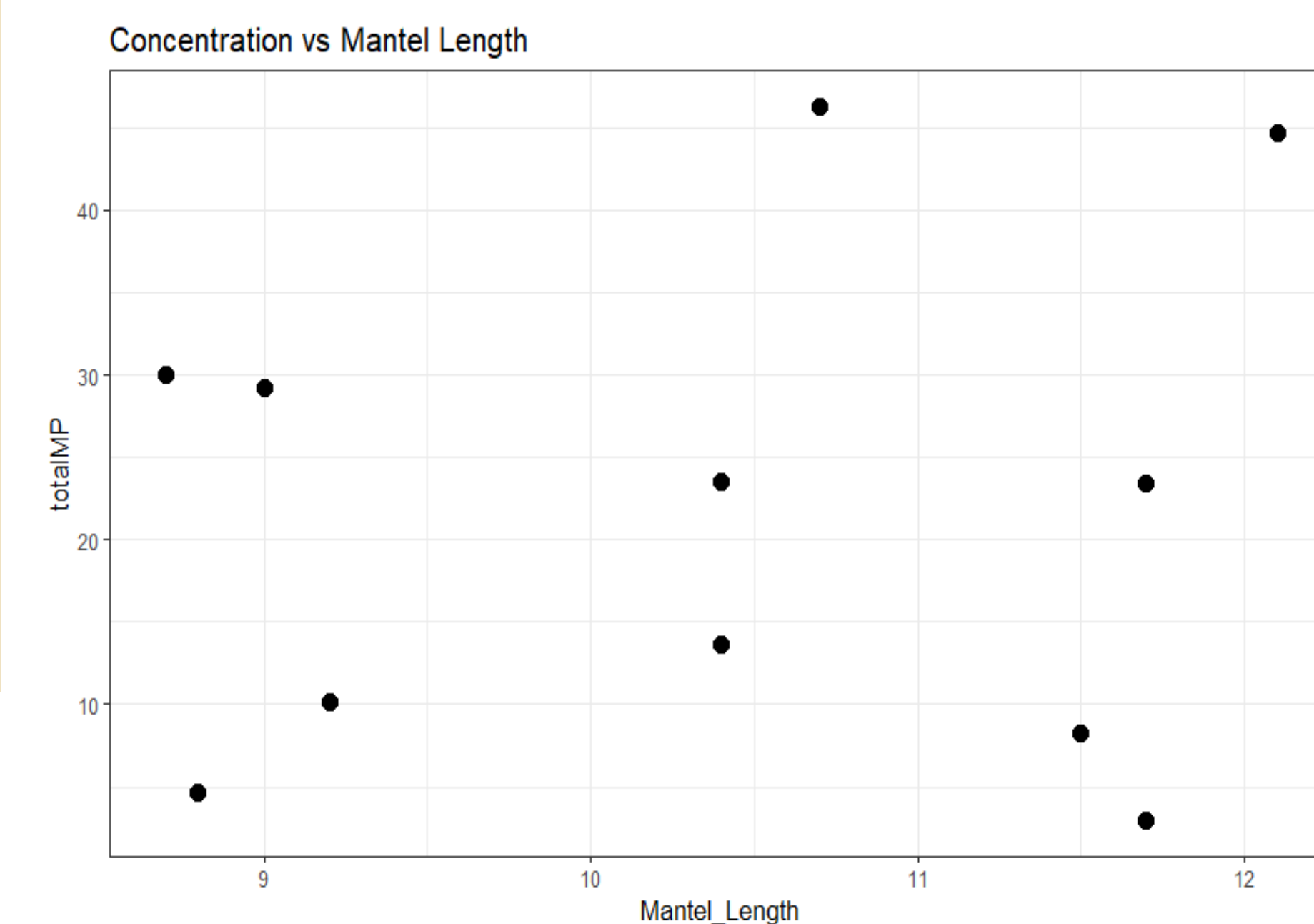


FIG 9. Concentration vs Mantel Length

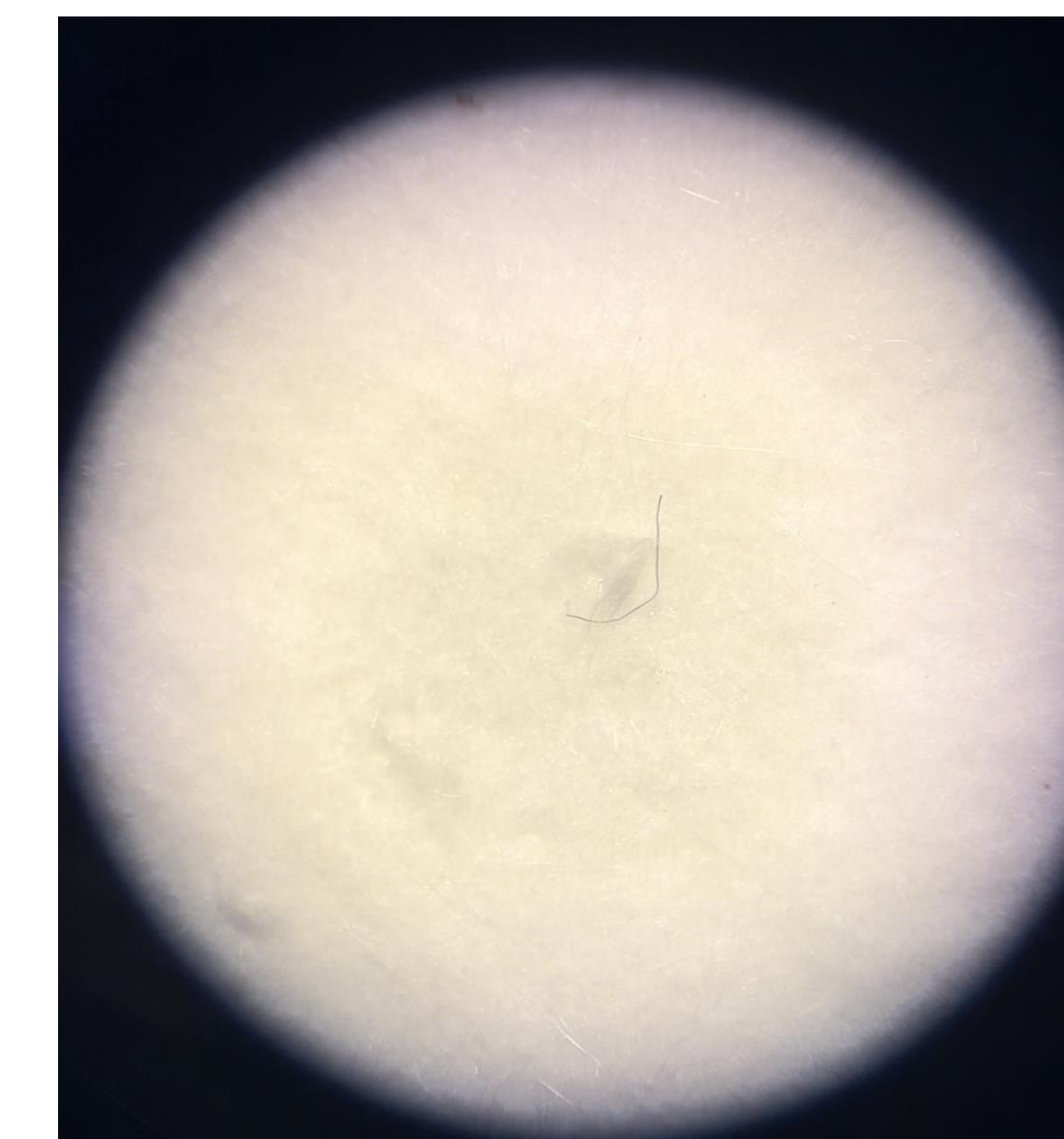


FIG 10. Microplastic Fiber

## DISCUSSION AND FUTURE WORK

- Our analysis of microplastics in squid stomachs and gills found that there is **significant differences in microplastic concentration between stomachs and gills (fig.7)**.
- There were **no significance in concentration of microplastics among different sites (fig.8)**.
- There were **no significance in concentration of microplastics based of off mantel length (fig.9)**.
- Fibers were processed through FTIR and confirmed to be polymers.
- This study showed that there was a presence of microplastics in California Market squid in the Puget Sound.
- This study can provide future implications of microplastics work in squids present in the Puget Sound.

## Acknowledgements

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## References

