Ibuprofen as a water pollutant on the defensive behaviour and microbiome of grass shrimp *Palaemonetes* spp.

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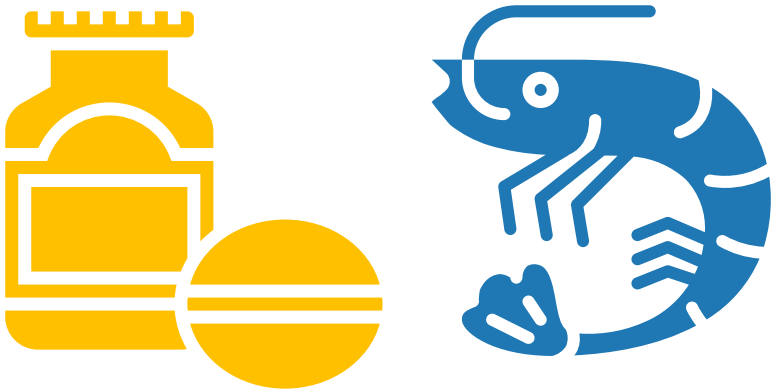


What do we know about ibuprofen?

19% Chronic Users

Stomach, Intestinal Complications

Increased *Pseudomonadaceae*, *Puniceicoccaceae* in the gut

- Unproved links to biological sequelae

Top 8 Contaminant

Compromise survival and reproduction

No data on gut microbiome effects

Hypothesis

1) shrimp will exhibit **lethargic and delayed defensive mechanisms** with raised ibuprofen concentration

2) Increased taxonomic abundance of ***Pseudomonadaceae*, *Puniceicoccaceae* families** with ibuprofen concentration

4 concentrations

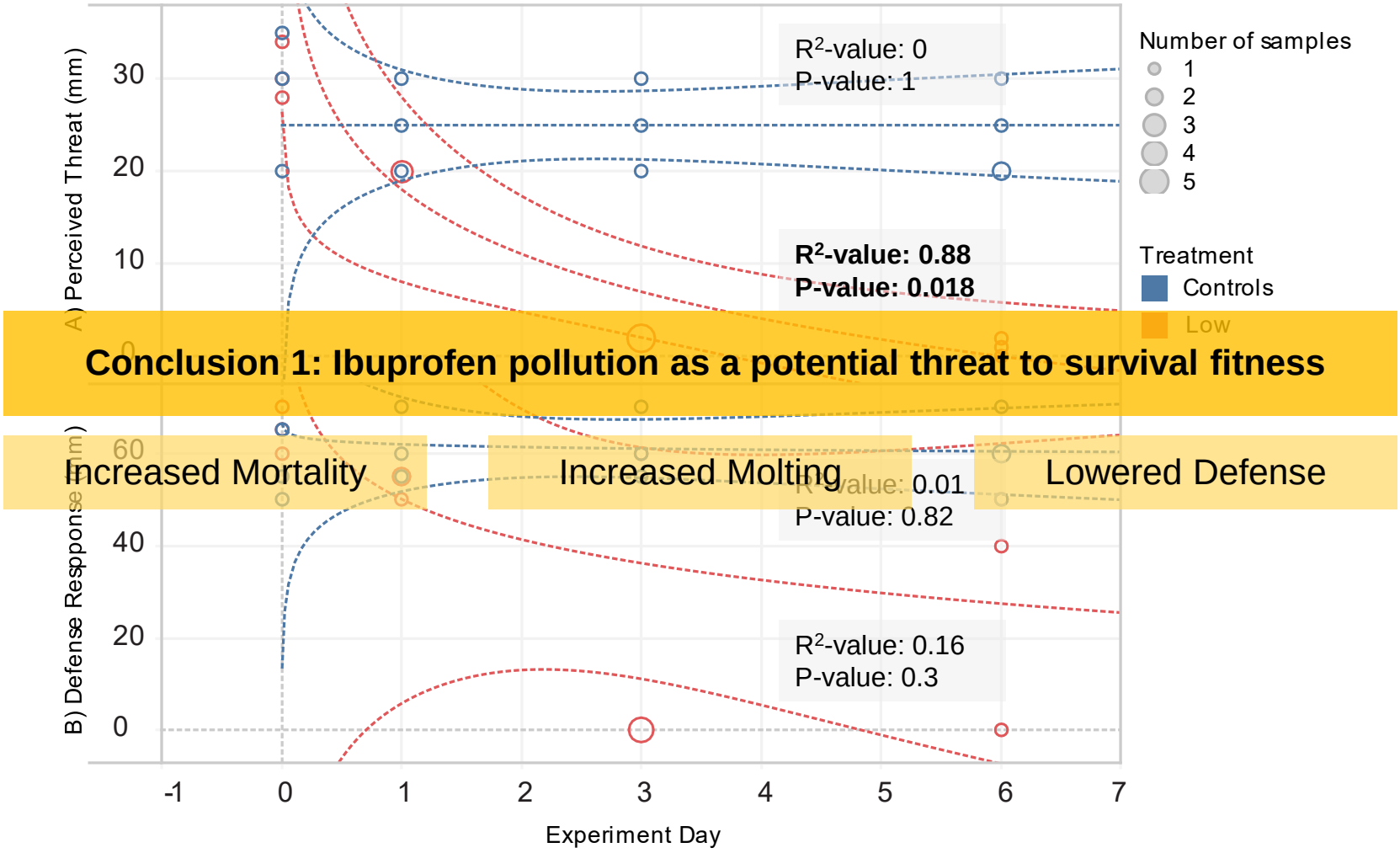
3 gut samples / tank

16S rRNA sequencing

% statistical analysis

Logistic Behavioural Regression

Significantly lowered defence mechanism capacity with low ibuprofen concentration

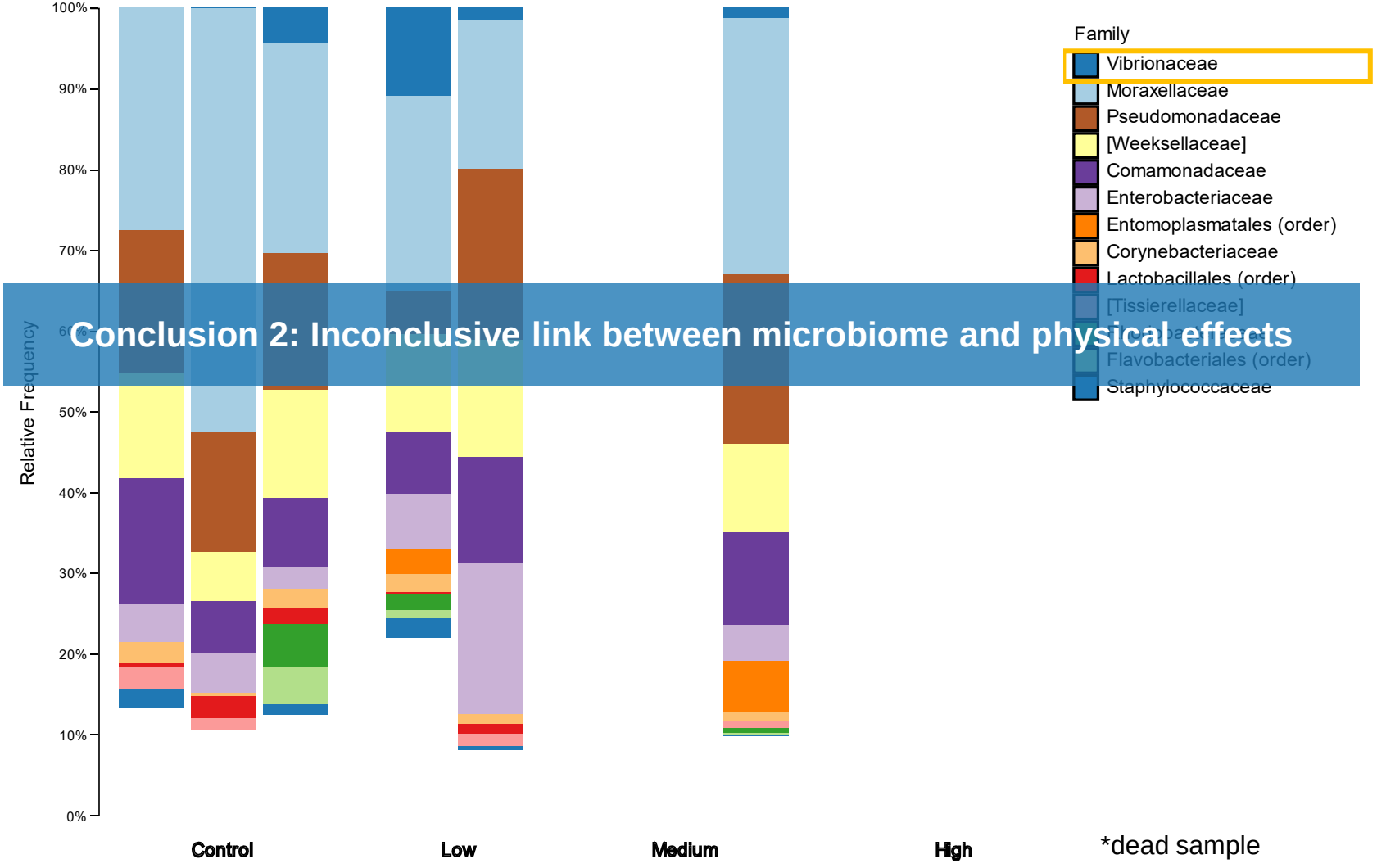


Conclusion 1: Ibuprofen pollution as a potential threat to survival fitness

Increased Mortality | Increased Molting | Lowered Defense

Taxa Bar Plot

Sequencing the gut microbiome: No significant taxonomic difference across treatments



Conclusion 2: Inconclusive link between microbiome and physical effects

*dead sample

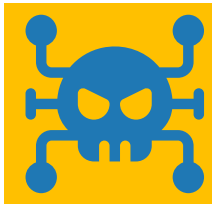
Limitations & Next Steps

Increase Sample Size

- 10% Power for effects in **alpha diversity**
- 63% Power for effects in **beta diversity**

Longer Time-scale

- Unable to infer long-term taxonomic changes
- **Host may have failed prior to microbial changes?**



The Role of *Vibrio*

- Unable to gain strain granularity beyond family
- **External pathogenesis, host manipulation, or natural decay?**

Pure v. Pills

- Other ingredients may be confounding factors
- **Implications for pill-making and waste management**