Testing for Variation in *Leptasterias* spp. Prey Preference Across Different Populations and Microhabitats

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Introduction

Sea star wasting disease (SSWD) has depleted many asteroid populations on the Pacific Northwest coast in recent years[1]. Due to the ecological importance of sea stars, the absence of them can severely alter the structure of intertidal communities[2]. In response to changes in community structure, the prey preference of sea stars should also change[3]. As sea star populations continue to diminish due to SSWD, it is important to monitor the prey preference of sea stars and determine how prey preference may affect distribution and abundance of sea stars.

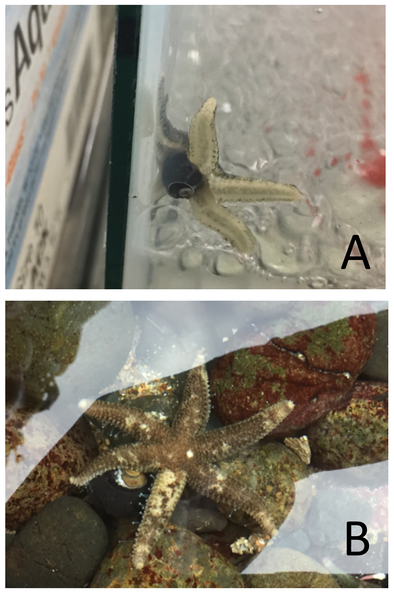


Figure 1: A) *Leptasterias* spp. in the lab feeding on *Tegula funebralis* (black turban snail). B) *Leptasteris* spp. in the field (Pigeon Point, CA) approaching *Tegula funebralis* (black turban snail).

Research Questions

- Does *Leptasterias* spp. prey preference differ between stars of different regions?
- Does *Leptasterias* spp. prey preference differ between stars of different microhabitats (intertidal rocks, intertidal pools)?

Collection Sites

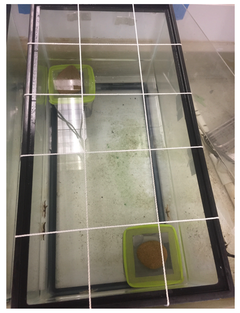
- 16 sea stars from Pescadero, California (Pigeon Point)
  - 10 from intertidal pools, 6 from intertidal rocks
- 10 sea stars from Humboldt County, California (Scotty Point, Palmers Point)
- 7 sea stars from Friday Harbor, Washington (Eagle Cove, Lime Kiln Point, False Bay)

Figure 2: Map indicating the regions where the sea stars used in the study were collected.

Prey Options

- *Tegula funebralis* (black turban snail)
- *Mytilus californianus* (mussels)
- *Balanus glandula, Cthalamus dalli* (acorn barnacles)

Tank Design



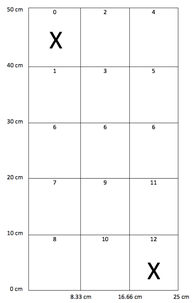


Figure 3: Overhead view and outline of the numbered grid of the experimental tank used for the study.

- Binary choice experiment (two different prey choices placed in containers at opposite ends of the tank)
- Stars were placed in middle of the tank and position number was recorded every 5 minutes for 60 minutes
- Average position calculated and used for statistical analysis

Treatments

	Trial #1	Trial #2
Control:	No Prey	No Prey
Treatment 1:	M & S	M & S
Treatment 2:	S & B	S & B
Treatment 3:	M & B	M & B

Figure 4: Each star went through two trials for the control and each of the three treatments: mussels and snails (M & S), snails and barnacles (S & B), mussels & barnacles (M & B).

Results

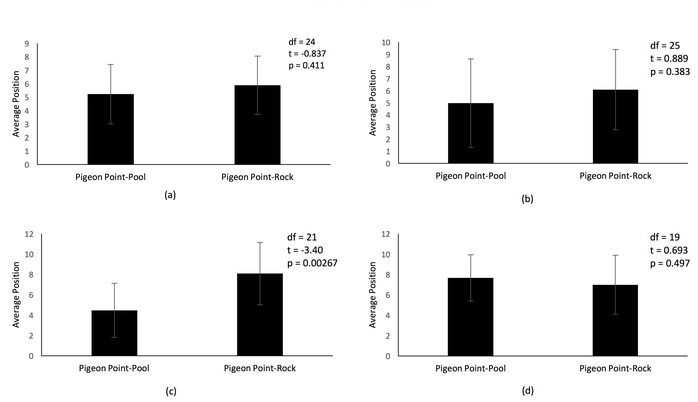


Figure 5: Average positions of *Leptasterias* spp. from intertidal pools and rocks from Pigeon Point in Pescadero, California, USA with no prey present (a), mussels (0) and snails (12) present (b), snails (0) and barnacles (12) present (c), and mussels (0) and barnacles (12) present (d). Error bars represent standard deviation. Results from two sample t-test included.

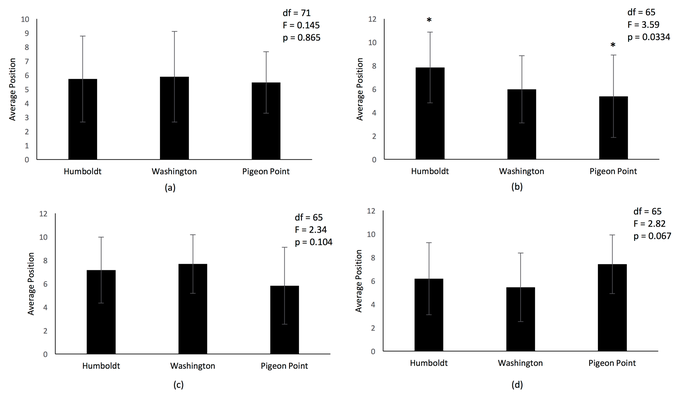


Figure 6: Average positions of *Leptasterias* spp. from Humboldt County, California, Friday Harbor, Washington, and Pigeon Point, California, USA and with no prey present (a), mussels (0) and snails (12) present (b), snails (0) and barnacles (12) present (c), and mussels (0) and barnacles (12) present (d). Error bars represent standard deviation. Results from one-way ANOVA included. Significantly different groups (determined from Tukey's test) indicated by (*).

Conclusions

- Results suggest that there may be differences in prey preference across different regions and microhabitats.
- Future direction:
  - A more controlled laboratory environment (consistent starvation period, feeding regime)
  - Equal time spent in the lab between different groups
  - Field observations/experiments
  - Determine species (likely different species between Pigeon Point, Humboldt, and Washington populations)

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References

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