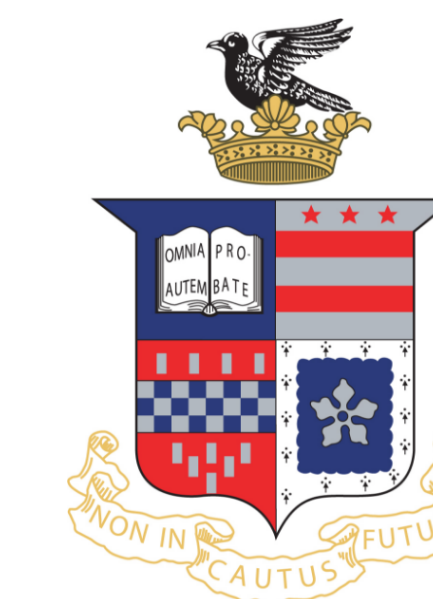


Habituation Learning in the Context of Aggression in Free Moving *Pogonomyrmex occidentalis*

Telese, R. ¹, Guignon, M. ², & Schreiber, W. ^{1,2}

¹Neuroscience Program, Washington and Lee University

²Department of Cognitive and Behavioral Science, Washington and Lee University



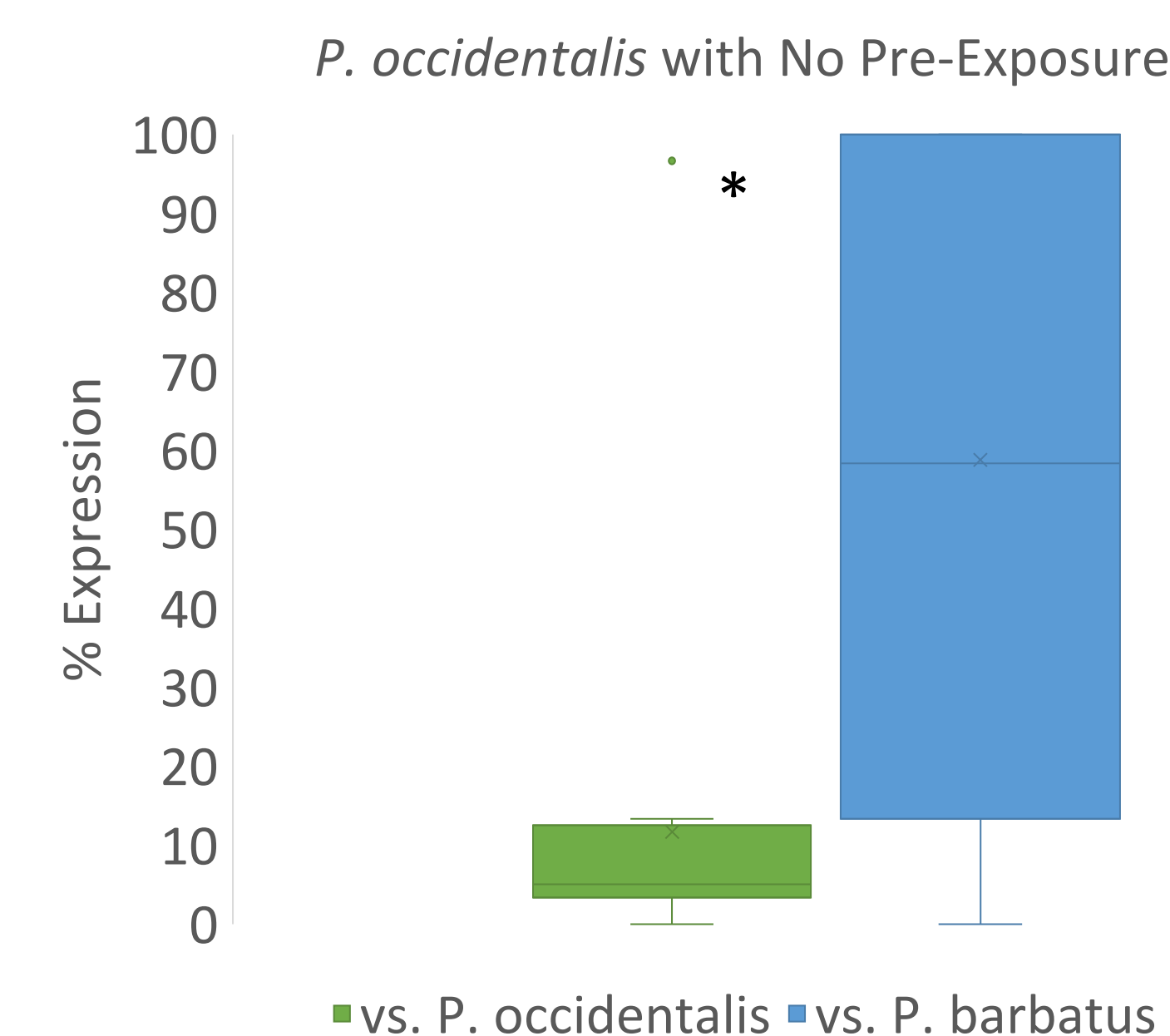
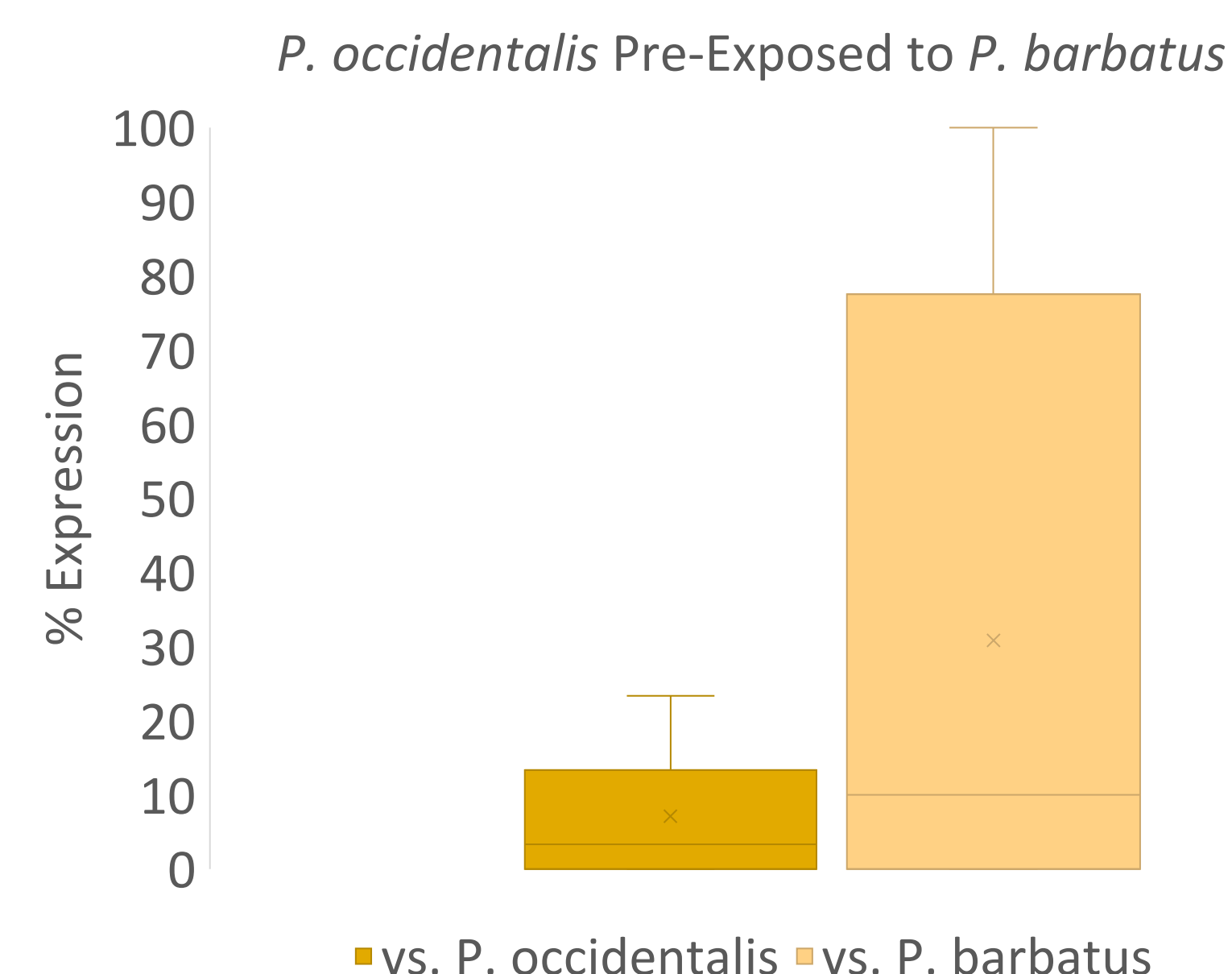
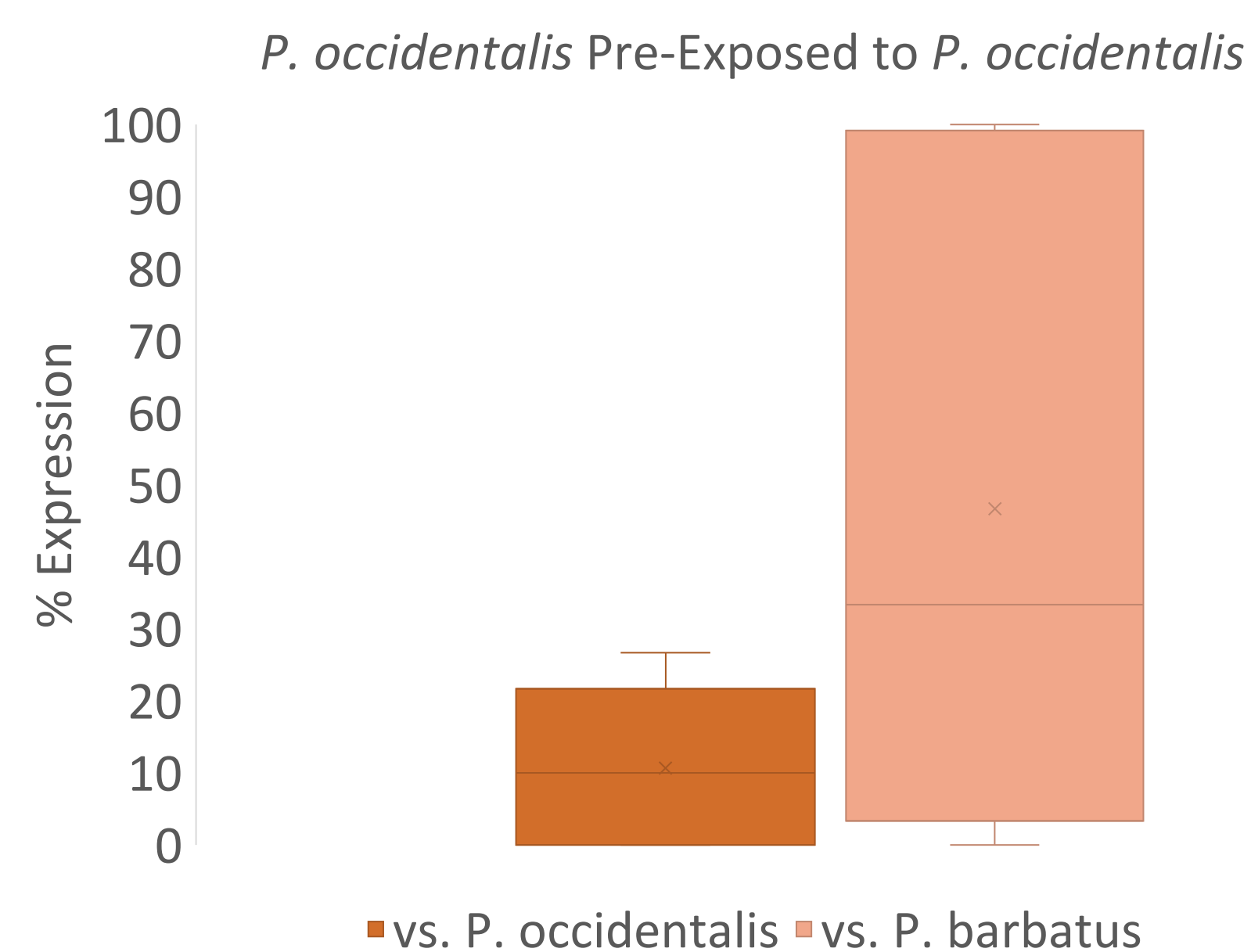
Introduction

- Habituation learning: a decrease in responding following a prolonged exposure to a stimulus.
- “Dear-enemy phenomenon”: in the wild, habituation learning is thought to cause ants living in close proximity to one another to decrease the expression of aggressive behavior.
- Hypothesis: *P. occidentalis* continuously pre-exposed to *P. barbatus* for 1 hr. will display less aggression towards *P. barbatus* than animals given no pre-exposure to *P. barbatus*.**

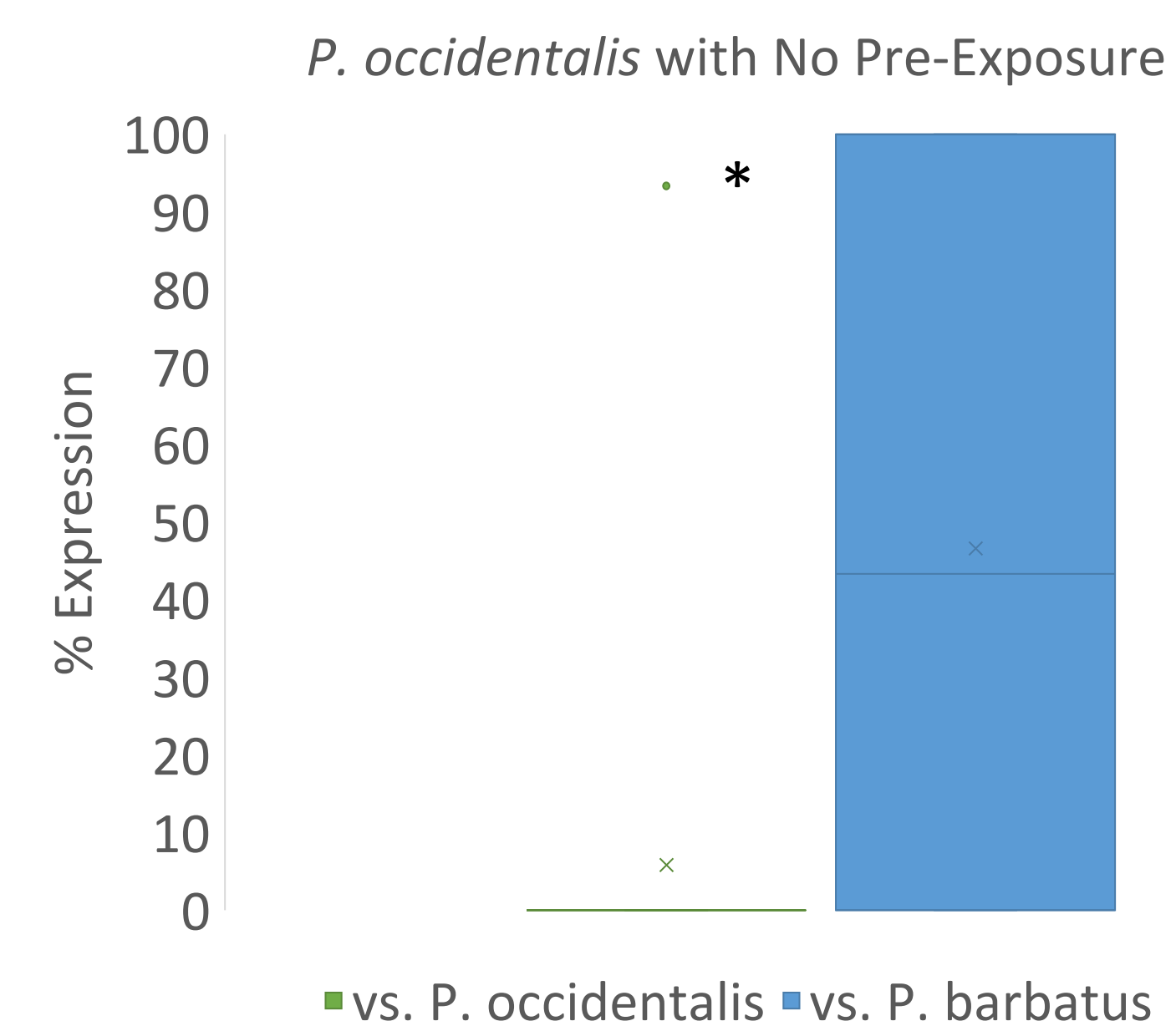
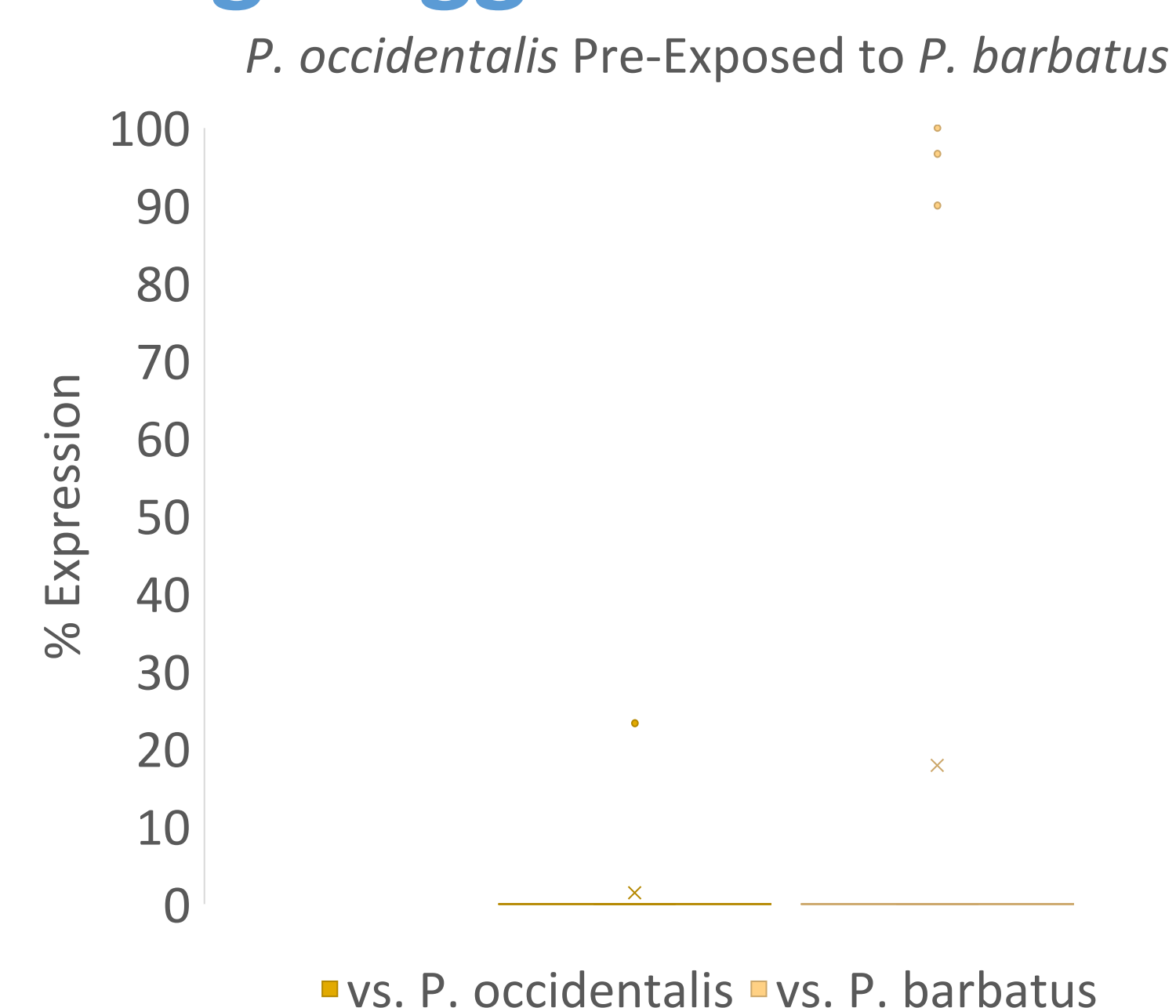
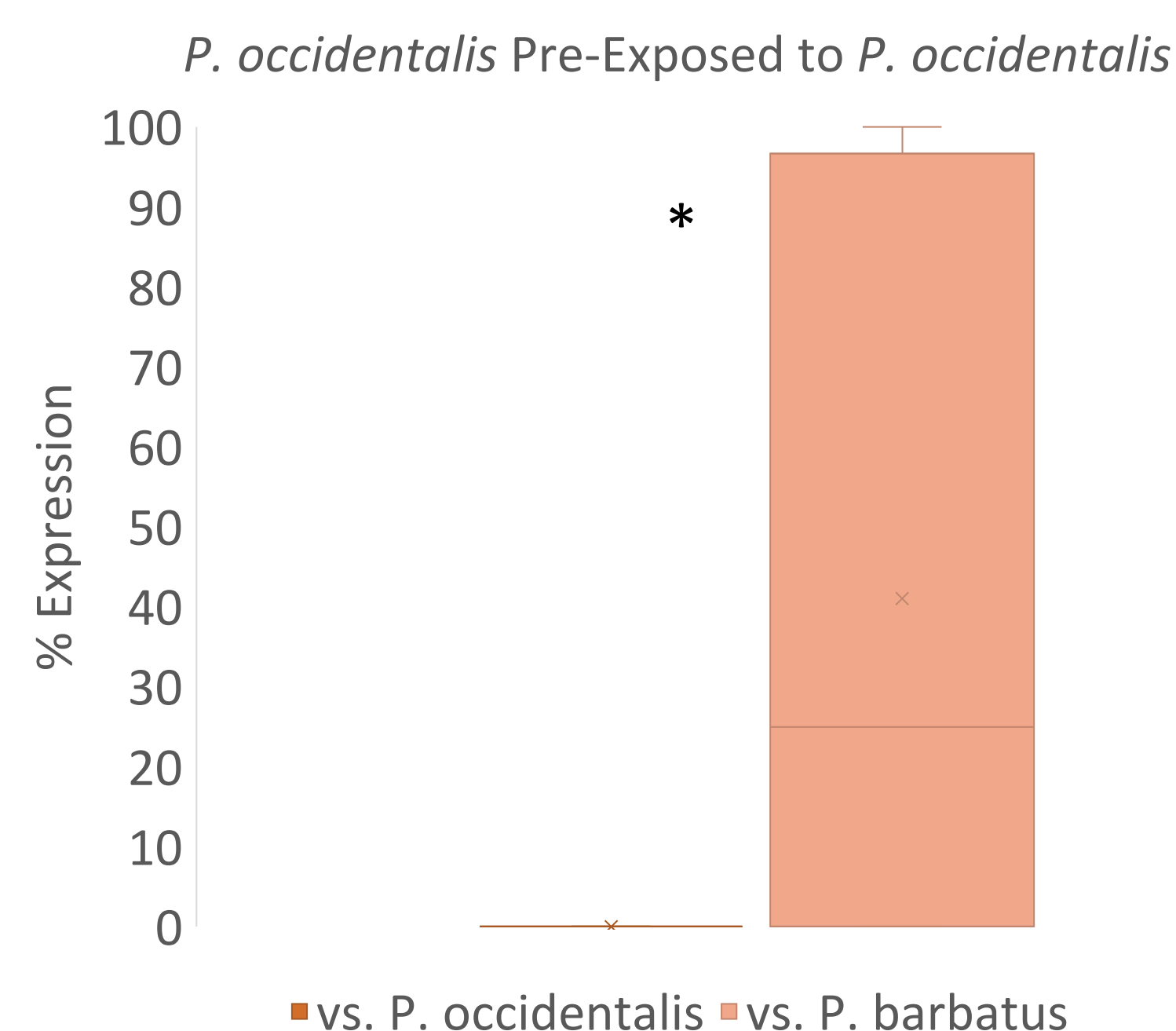
Methods

- Habituation training: ants were placed into an arena, separated by a barrier (tea steeper) and left for a 60-minute habituation period.
- Retention/generalization test: after 60 min, one *P. occidentalis* test ant and one stimulus ant were placed in a different glass arena without a barrier for 5 min.
- Behavior of the habituated ant (inside the barrier) was recorded and sampled every 10 seconds for 5 minutes and categorized as follows:
 - “Low aggression”: Opening their mandibles as wide as head, biting the other ant
 - “High aggression”: Engaged with no space between the two ants at any point during the observation

Low Aggression Behavior



High Aggression Behavior



Results

- “Low-aggression behavior” towards *P. barbatus* was lower following pre-exposure to *P. barbatus* compared to animals that received no pre-exposure.
- “High-aggression behavior” towards *P. barbatus* was lower following pre-exposure to *P. barbatus* compared to animals pre-exposure to *P. occidentalis* or animals which received no pre-exposure
 - Pre-exposure causes *P. occidentalis* to treat *P. barbatus* like nestmates
- Experimental procedures alone (No Pre-Exposure) had no effect on normal social behavior towards nestmates/non-nestmates

Discussion

- Decreases in high aggression responding to *P. barbatus* were both **dependent upon pre-exposure to *P. barbatus*** and **stimulus-specific**
 - Suggests a habituation effect
- Findings are **consistent** with the predictions of the “dear-enemy phenomenon”
- Magnitude** of the behavioral response an important consideration when measuring frequency of behavioral expression as a D.V.