



Temple University
Department of Biology

- Master's Thesis Defense -

TITLE

*“Interactive effects of predation
and assembly time on tropical but
not temperate marine invasions”*

Katherine Alexandra Stevenson

TIME AND PLACE

Friday, June 28, 2024

10:00 AM

Biology Life Science Building

Room 234

Thesis Committee:

Dr. Brent Sewall, Advisor, Temple University

Dr. Amy Freestone, Committee Member, Temple University

Please contact the Biology Department with any questions at 215-204-8854

Abstract: Non-native species richness has been observed to peak at mid-temperate latitudes, shaping a pattern of richness and abundance that is distinct from native species patterns which peak in the tropics. Stronger species interactions, and therefore biotic resistance, may lower invasion success in the tropics and help explain the discrepancy between native and non-native richness and abundance. To test the hypothesis that strong predation and competition in the tropics could limit invasion success, we conducted a distributed experiment on sessile marine invertebrate communities in four regions spanning 47-degrees latitude of the eastern Pacific Ocean. We manipulated predator access and resource availability at 12 sites and sampled experimental communities in early and late stages of assembly. Overall, our results suggest that biogeographic location, assembly timescale, and predation interactively shape invasion success across latitude. Strong predation reduced richness of non-native species in the tropics at both assembly timescales but increased non-native species richness in the subtropics during early assembly. Predation also increased non-native abundance in the tropics by late-stage assembly and shaped non-native composition at both assembly stages. Effects of predation at higher latitudes were weak or undetectable, and increasing resource availability never had a positive impact on non-native richness or abundance at any latitude. Further, non-native richness was greater at early relative to late assembly stages at mid to low latitudes and was consistently low in our high latitude region at both timescales. In a complementary experiment, short-term predator exposure reduced non-native abundance in Panama, further confirming the influence of predation in this tropical region. Our results highlight important biogeographic differences in invasion dynamics and disentangle local mechanisms that can shape regional patterns.