



Paving the Way to Sponge Restoration in Florida Bay: Evaluating Restoration Techniques

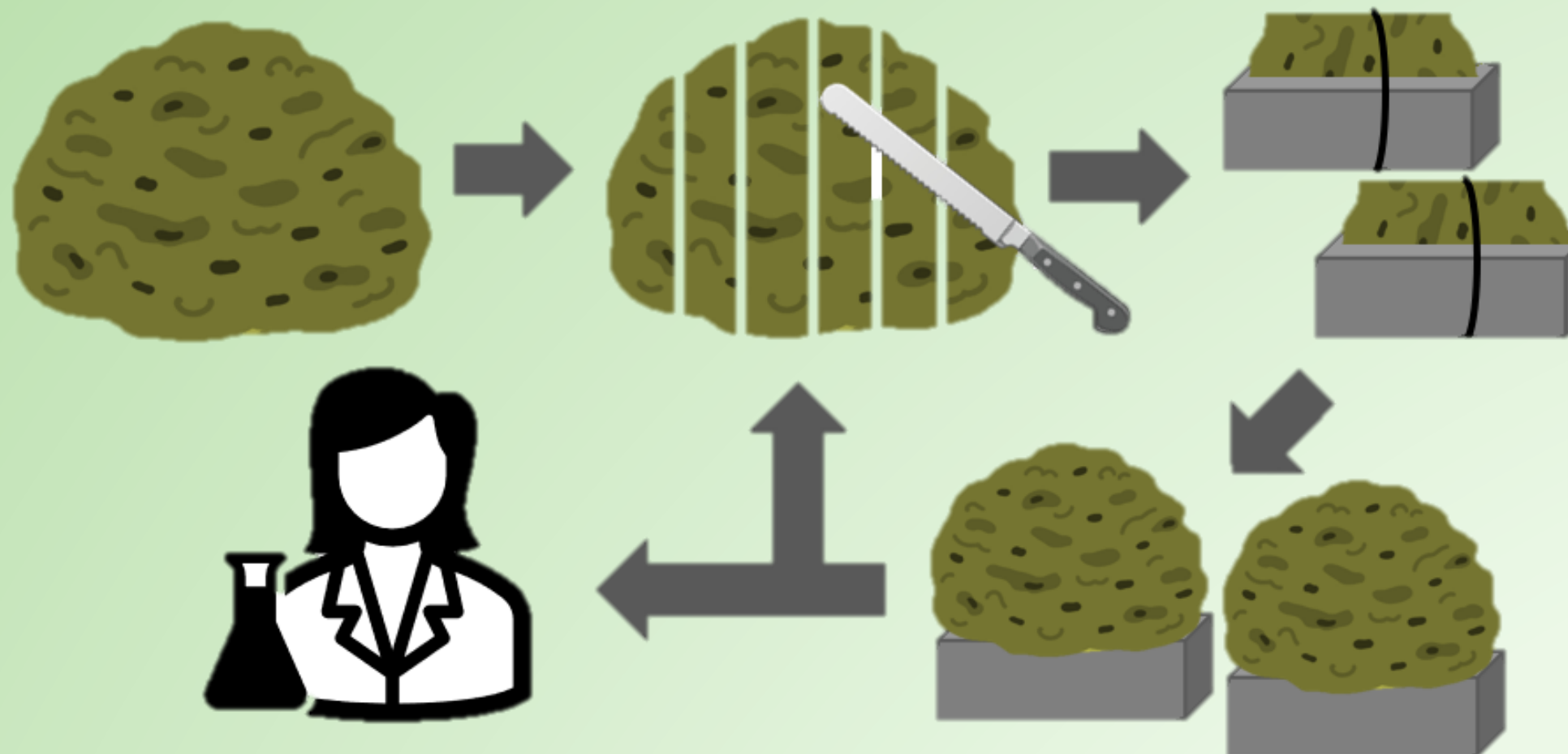
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Sponge Communities in Decline

- Sponges provide many ecological services to nearshore hard-bottom communities in Florida Bay, including filtering water and providing habitat.
- Over recent decades, sponge communities in Florida Bay have become degraded, primarily due to cyanobacterial blooms.
- The loss of sponges and their ecological services inspired the development of assisted sponge restoration efforts in the region.



- Vegetative Propagation:** Tissue from a 'donor' sponge is fragmented into smaller pieces and attached to a baseplate.

Objectives

- Q1: Does the type of baseplate used influence sponge survival and attachment?
- Q2: How does the type of zip-tie used to attach sponges to cement pavers affect survival, attachment, and growth?



Vase sponge
Ircinia campana



Glove sponge
Spongia graminea



Loggerhead sponge
Spheciospongia vesparium

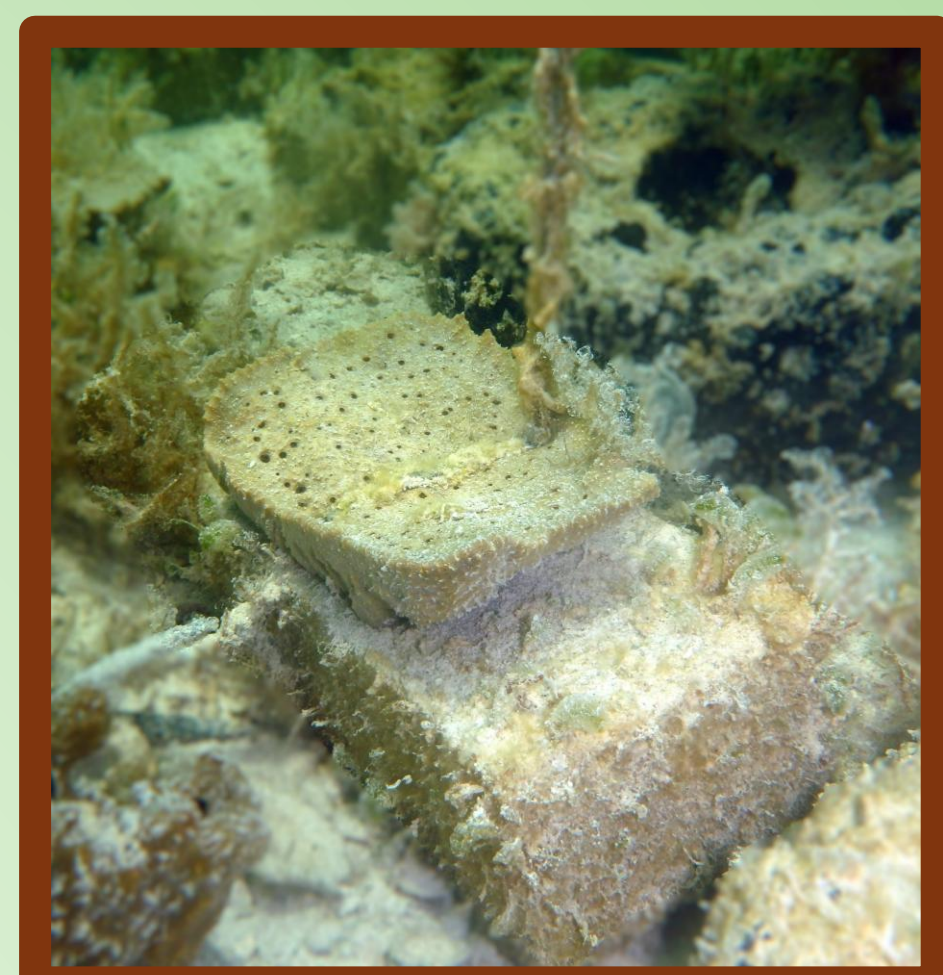


Methods

- Two experimental plots were established using newly propagated sponges at Sandfly sponge nursery.

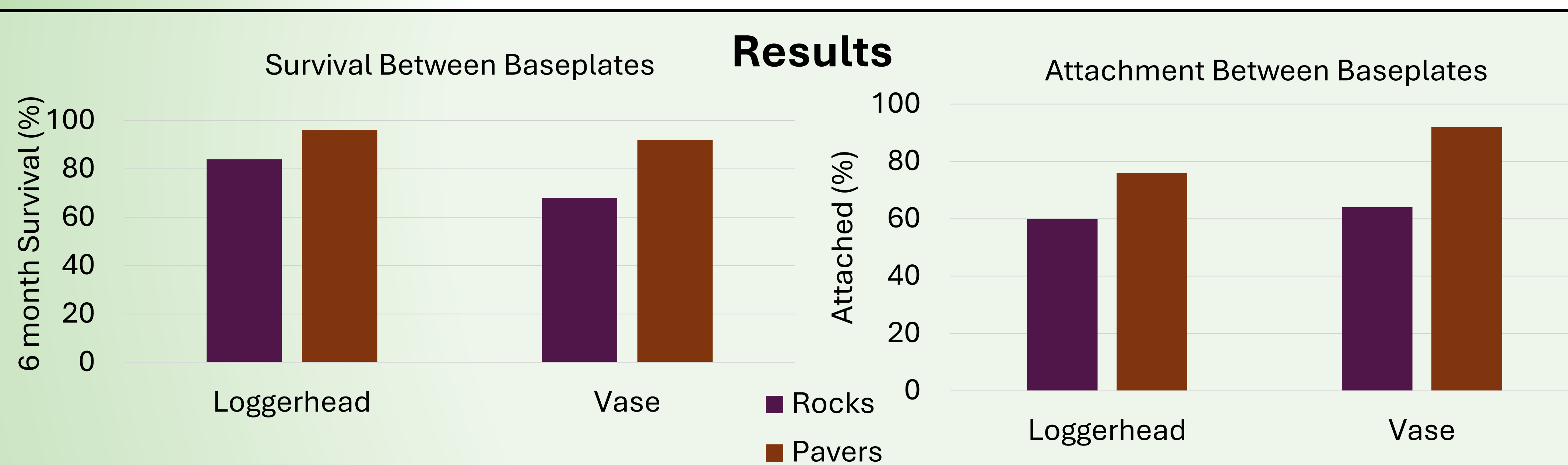
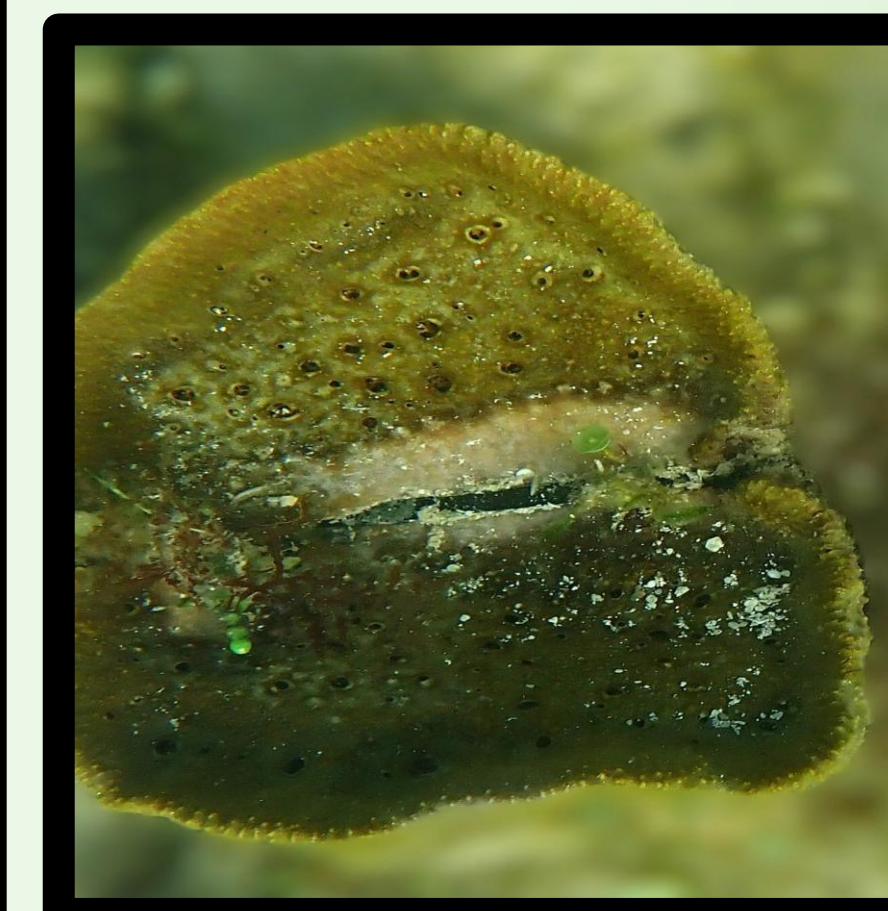
Baseplate: Rocks v. Pavers

- Loggerhead and vase propagates were attached to either rocks or pavers (N=25).
 - Monitored for survival and attachment.



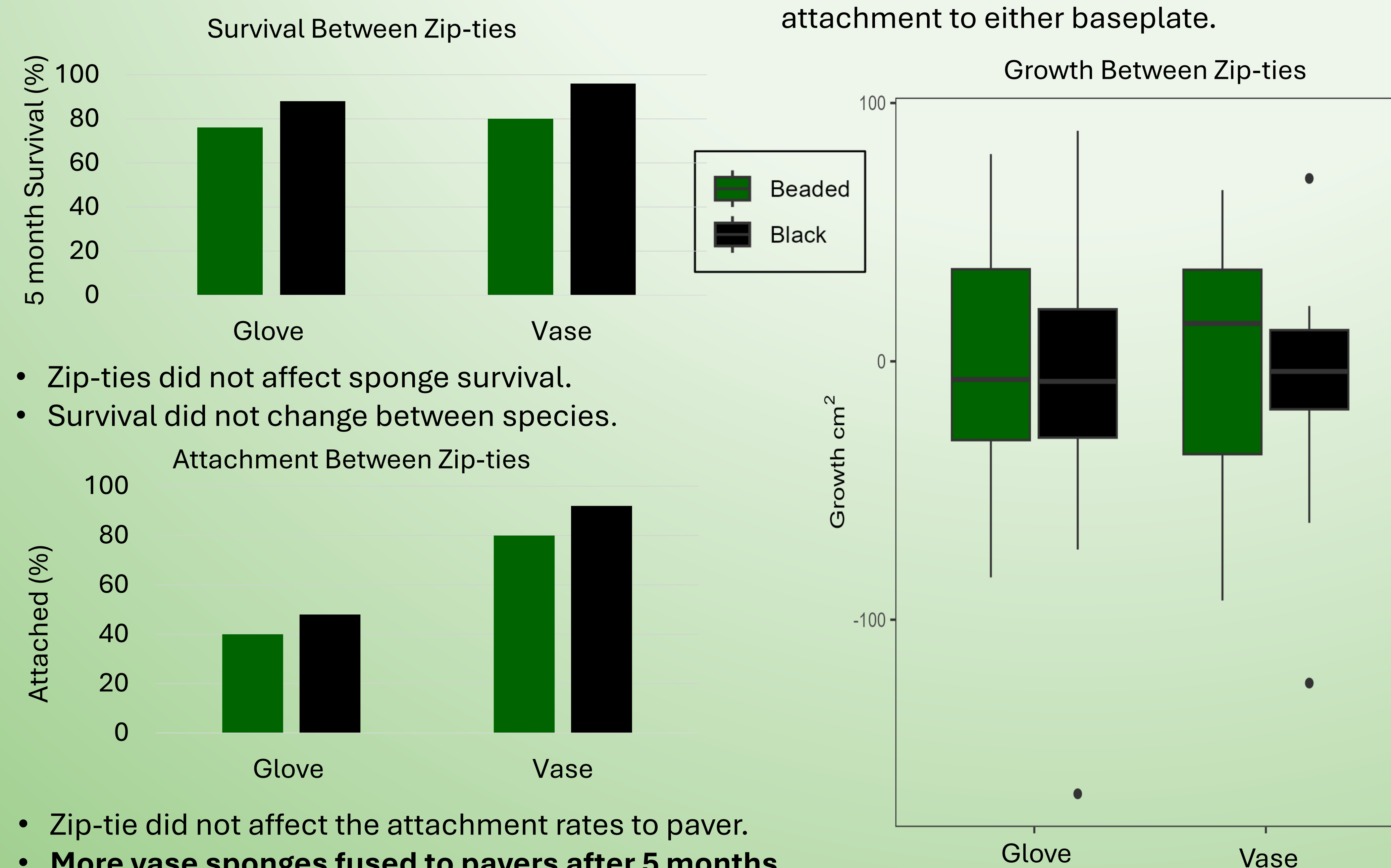
Zip-tie: Cable v. Beaded

- Glove and vase propagates were attached to pavers using either beaded zip-ties or cable ties (N=25).
 - Surveyed monthly for survival, attachment, and growth.
 - Surface area was measured using ImageJ to compare growth.



- There was a **higher survival rate for vase sponges on pavers** ($p = 0.034$). Baseplates did not affect survival of loggerhead sponges.

- Vase sponges had a greater attachment rate on pavers** ($p = 0.01686$).
- Loggerhead sponges showed no preference in attachment to either baseplate.



- Zip-ties did not affect sponge survival.
- Survival did not change between species.
- Zip-tie did not affect the attachment rates to paver.
- More vase sponges fused to pavers after 5 months than gloves** ($p = 0.00275$).
 - 86% of surviving vase sponges attached.
 - 44% of surviving glove sponges attached.

Sponge Growth (both species):

- Growth between sponge species and treatment was not significant.

Conclusions

- Vase sponges showed significantly greater survival and attachment on pavers compared to rocks.
- Both glove and vase sponges exhibited some tissue loss from prolonged zip-tie contact, regardless of zip-tie type.
- Future restoration protocols should stress minimizing contact time with zip-tie to reduce necrosis.
- These findings will be used to guide future sponge restoration techniques.



Acknowledgments

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