Evaluating potential biodegradable twines for use in the tropical tuna FAD fishery

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LA JOLLA

The Problem

Increasing use of DFADs built with no biodegradable materials

Objective

- To test and develop biodegradable materials for the construction of an effective FAD that covers all the requirements of fishers and environmental needs
  - ✓ By-catch reduction
  - ✓ Affordable
  - ✓ Reproducible
  - ✓ Lifetime
  - ✓ Aggregate biofouling and potentially tuna

Materials

- Cotton

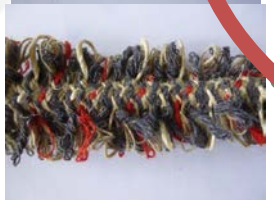
TWISTED

- Reg. Cotton + Sisal

- Reg. Cotton + Linen

PLAITED & BULKED

- Cotton + Reg. Cotton + Linen



- Reg. Cotton + Sisal + Hemp

Methods

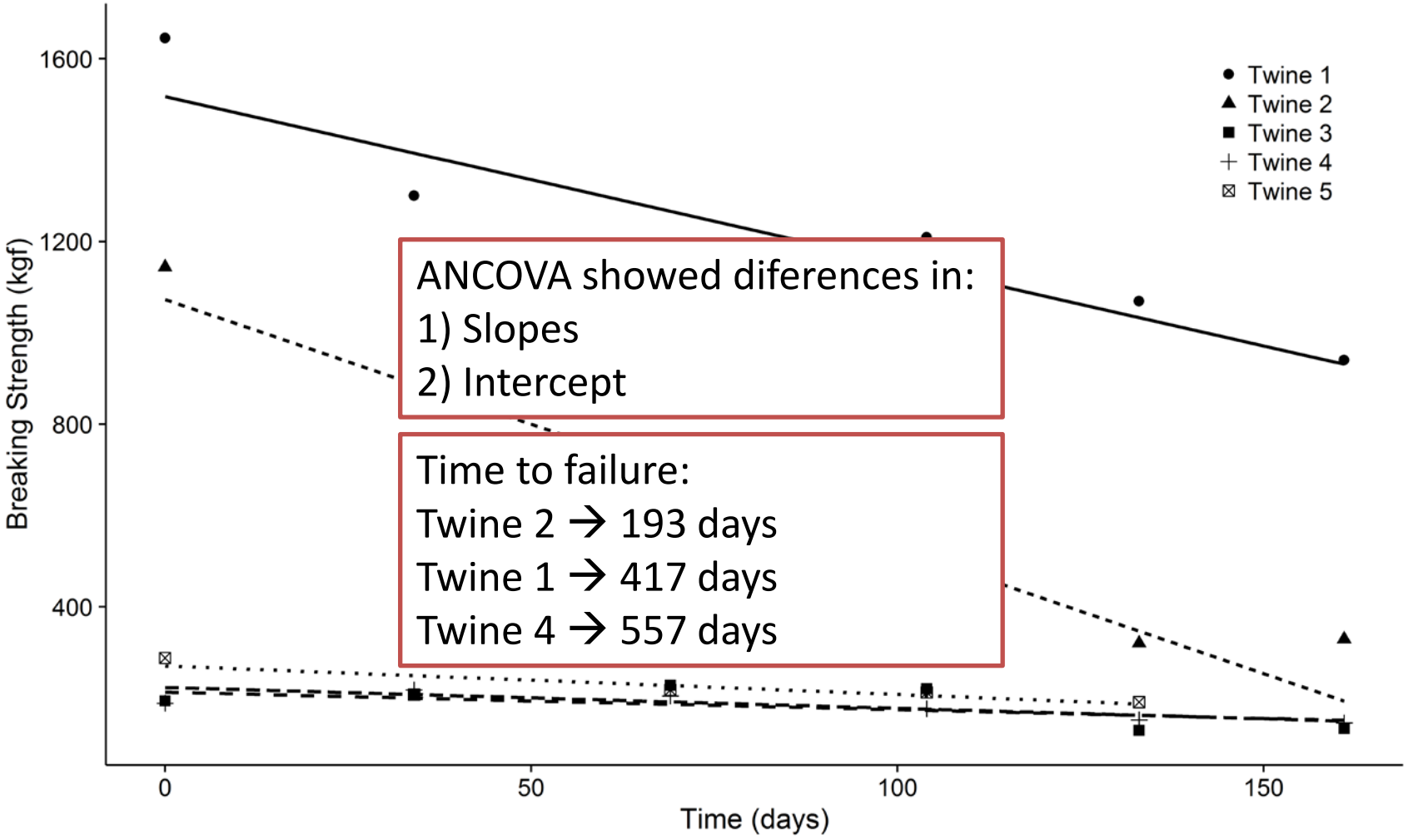
- Deployment of samples (160 days; 5 samplings)

Methods

- Sampling and measuring: Bio, Fmax, etc.

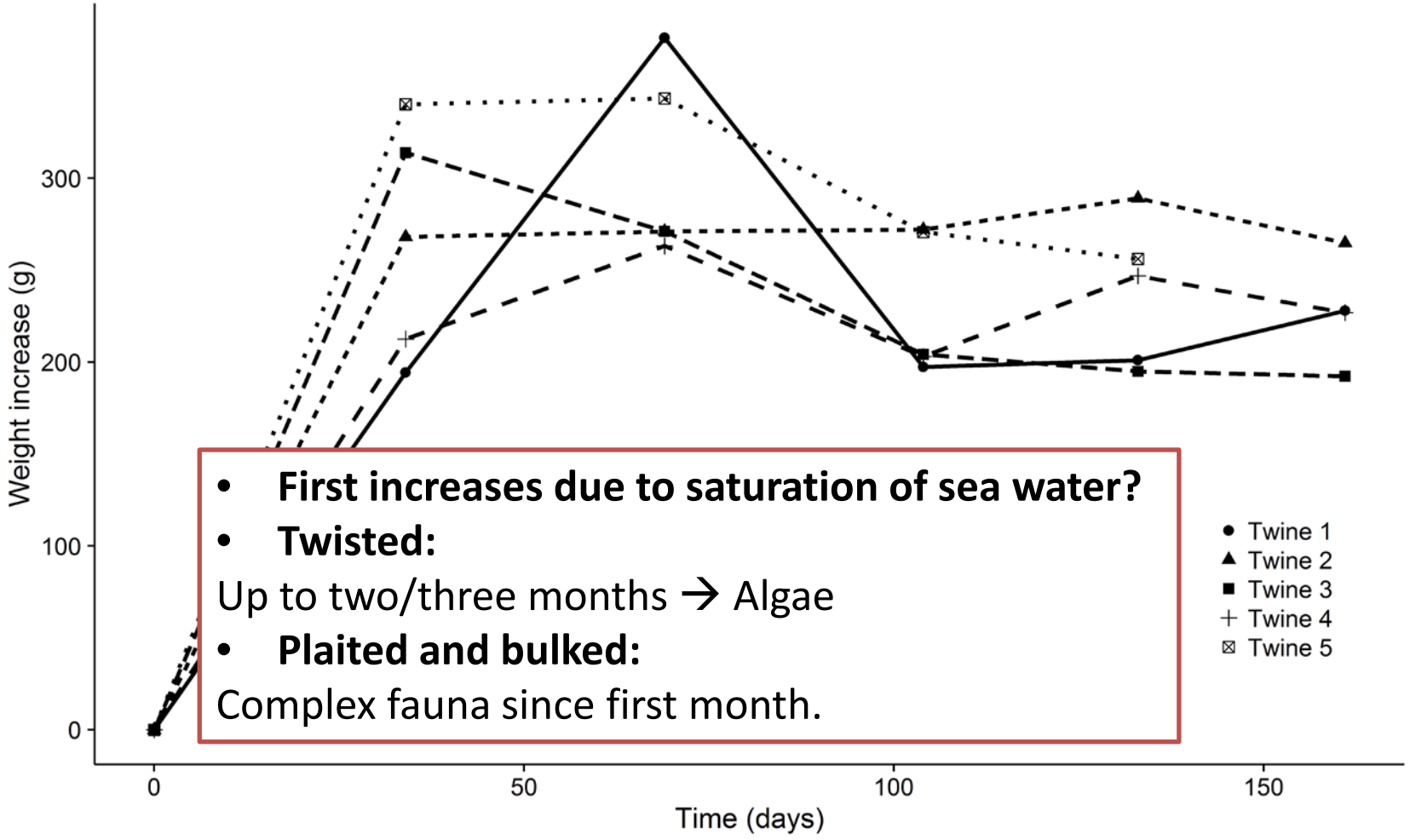
Results

- Breaking strength decrease ~ degradation



Results

- Weight increasing on time ~ Biofouling



- **First increases due to saturation of sea water?**
- **Twisted:**

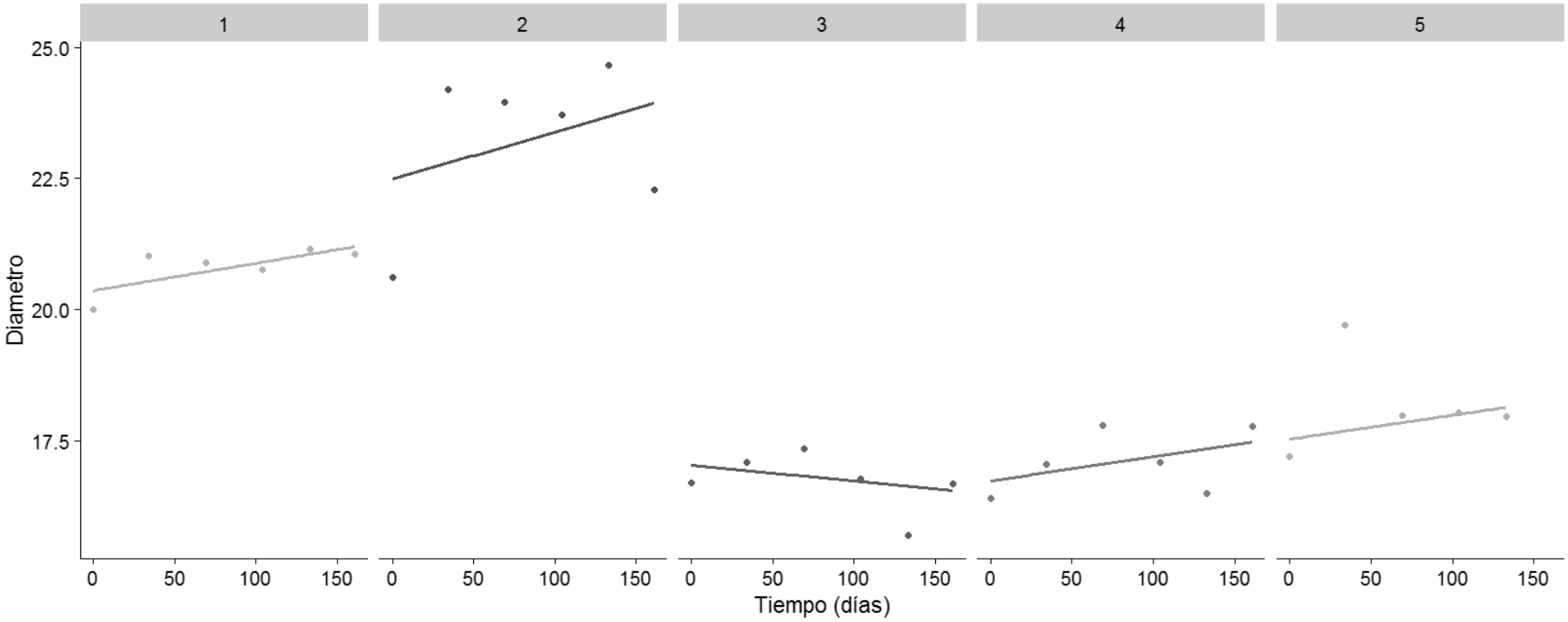
Up to two/three months → Algae

- **Plaited and bulked:**

Complex fauna since first month.

Results

- Diameter increasing with time ~ Biofouling



Conclusions

- Initial descriptors are not an appropriate indicator of degradation at sea.
- Combination of construction design and material is highly significant for degradation rates.
- Different degradation rates by twine (Twine 2 → 193 d).
- All twines showed good probability of biofouling.
- Plaited and bulked twines faster complex colonization.

Prospect Work

- Explore new materials and designs?
    - A twisted and bulked cotton, sisal and linen twine.
- Increase the number of samples and soaking time.
- Testing of resulting materials at DFADs in:
    - Regular commercial fishing trips
    - Anchored FADs in tropical areas
- Discuss results with fishers and keep improving.

ESKERRIK ASKO, GRACIAS,

THANK YOU

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