



Patella vulgata



Patella ulyssiponens

If you can't beat them, join them: enemy shells as refugia from grazing & competition pressure

Louise Firth

Clubley C, McGrath A, Renshaw E, Foggo A, Wilson A, Gribben P, Flower A, Burgess J, Heesch S, Hawkins SJ, Stephen N, Haspel D, Spain-Butler A, Newstead A, Knights AM



**UNIVERSITY OF
PLYMOUTH**



**Universität
Rostock**



Ecosystem Engineers:

Create, modify & maintain habitats

Habitat-forming



Habitat-modifying



Profound impacts on community structure & functioning

Ecosystem engineers:

Mediate consumer-resource interactions



Chemical

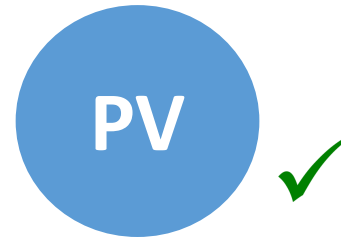
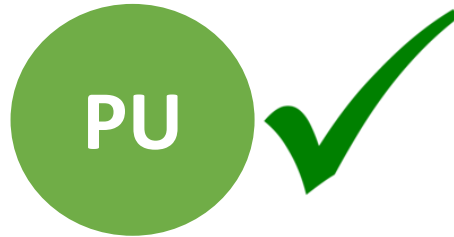


Behavioural



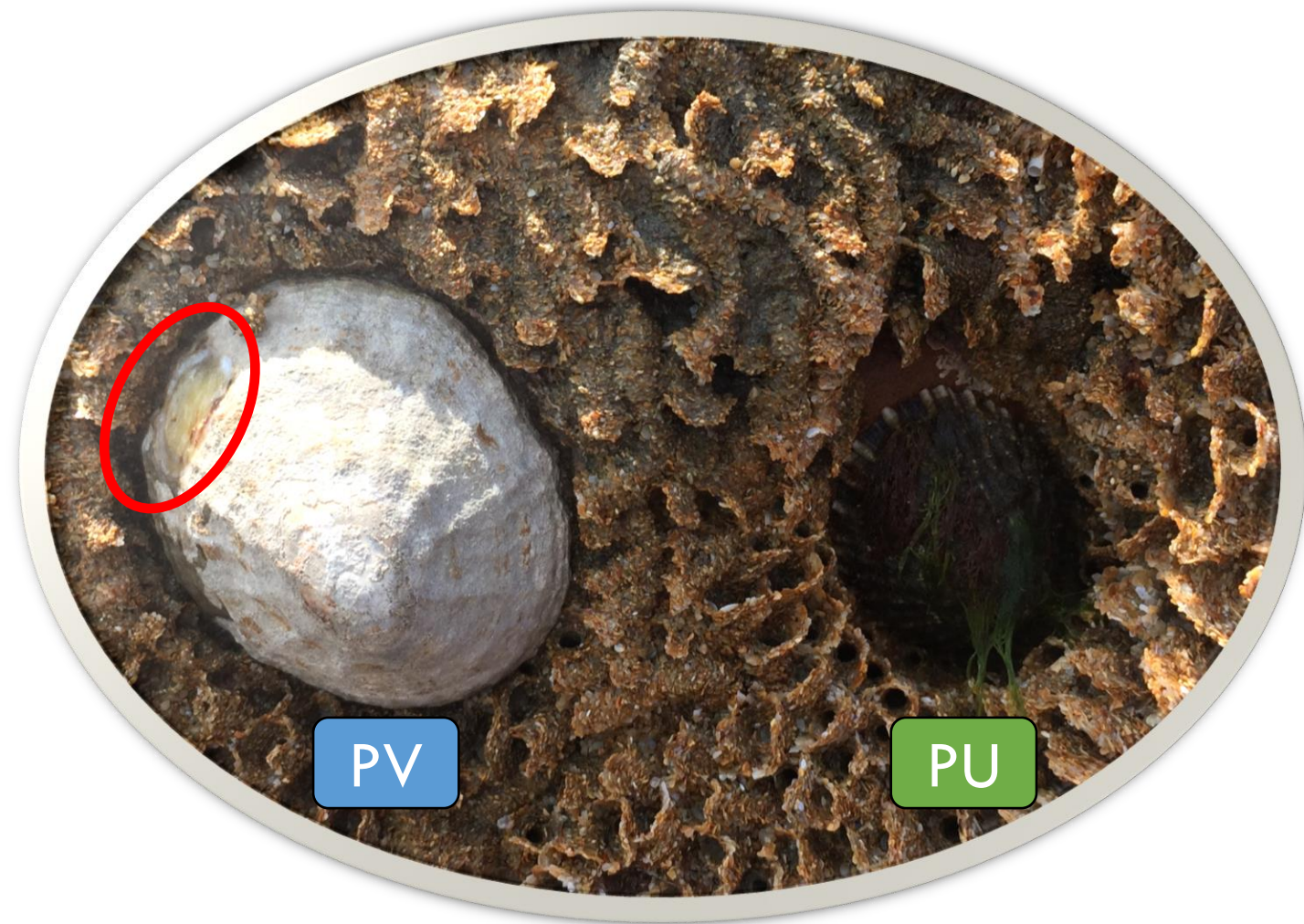
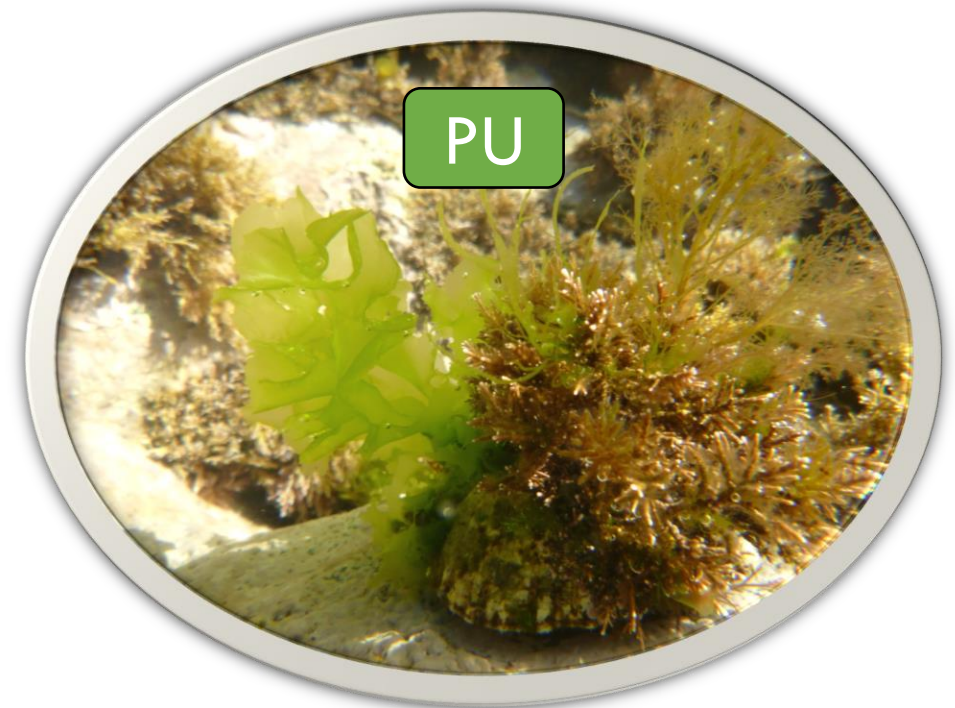
Physical

Test system: NE Atlantic rocky shores



Mutual grazing:

Key biotic interaction



Overarching questions

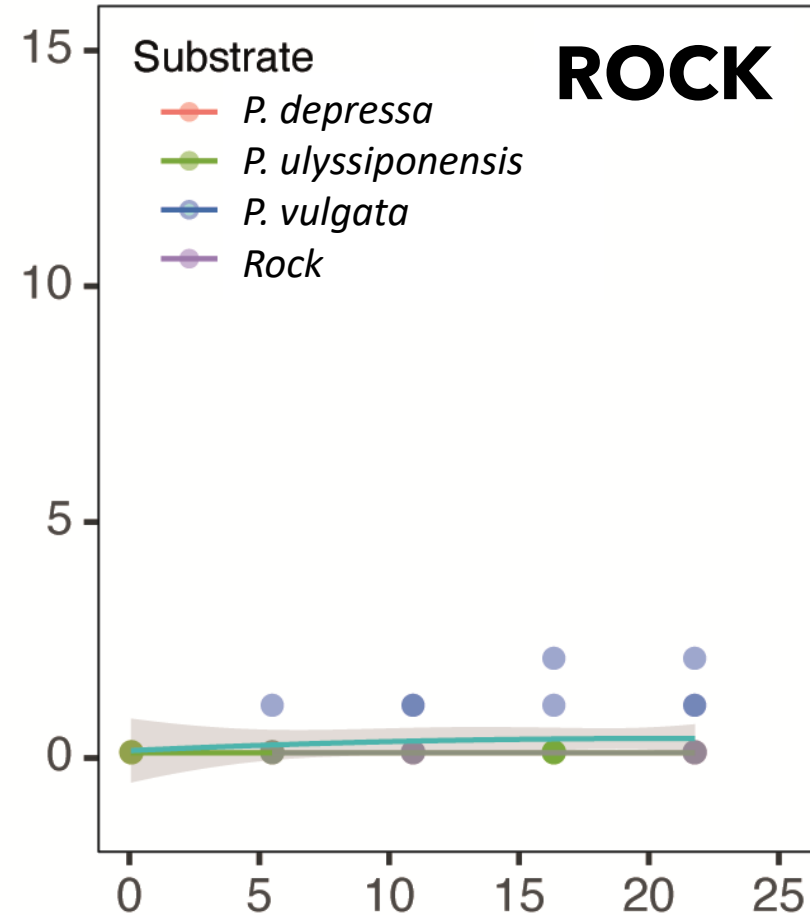
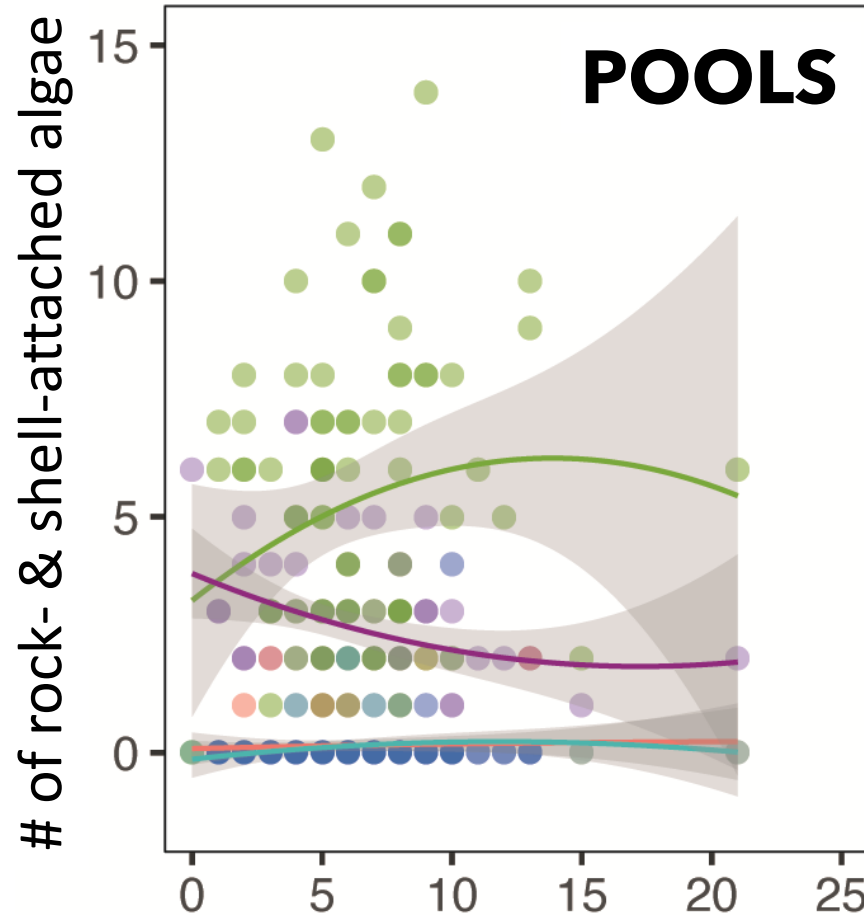
Do limpet shells provide associational refugia for algae & competitors?

What role to species-specific trait mediated interactions play?

Survey 1: Limpets as habitat for algae:

PU more important than PV or PD

% limpets with epibionts



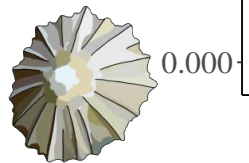
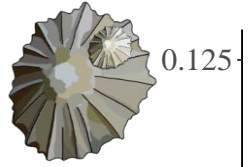
Limpet density per quadrat

Survey 2: Limpets as habitat for algae: Context specific (where PU is abundant)

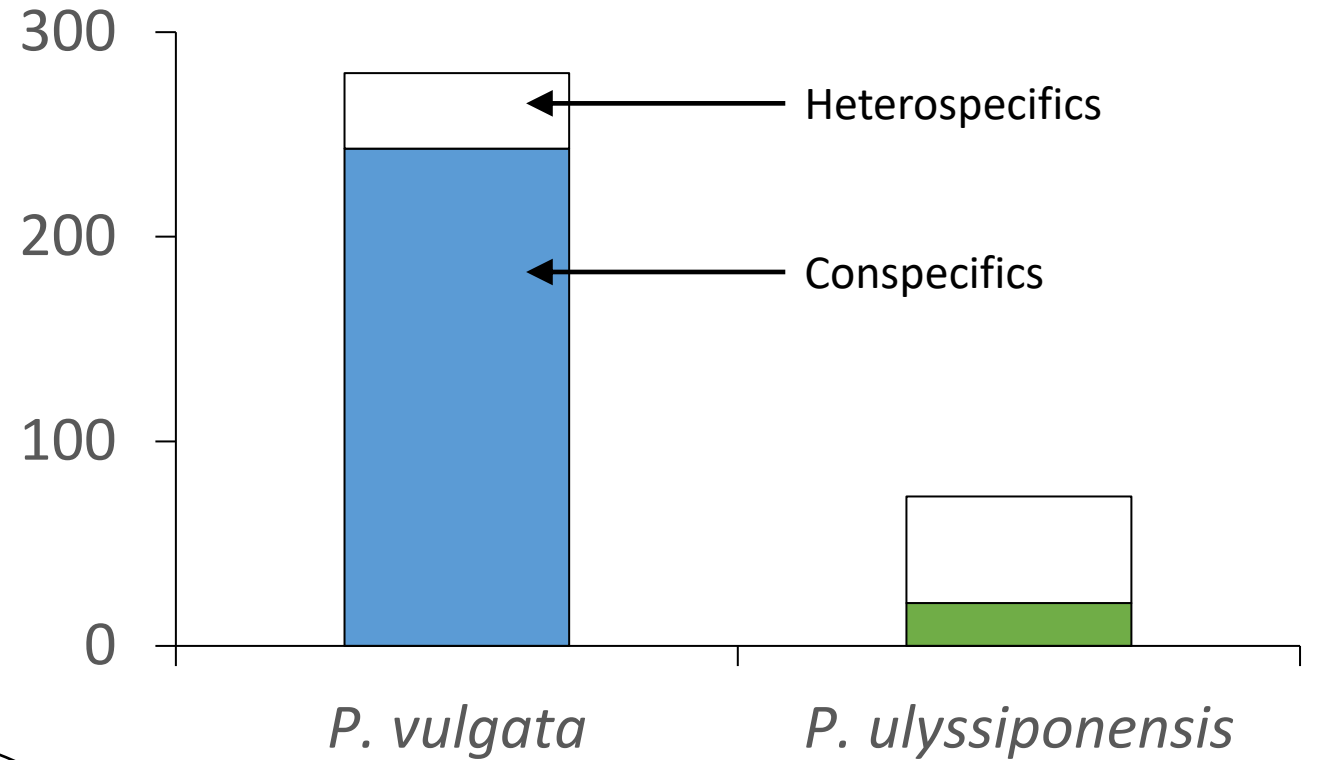


**Artificial
habitats can
be
LIMPET
BARRENS**

Survey 3: Limpets as habitat for competitors: PV more important than PU or PD



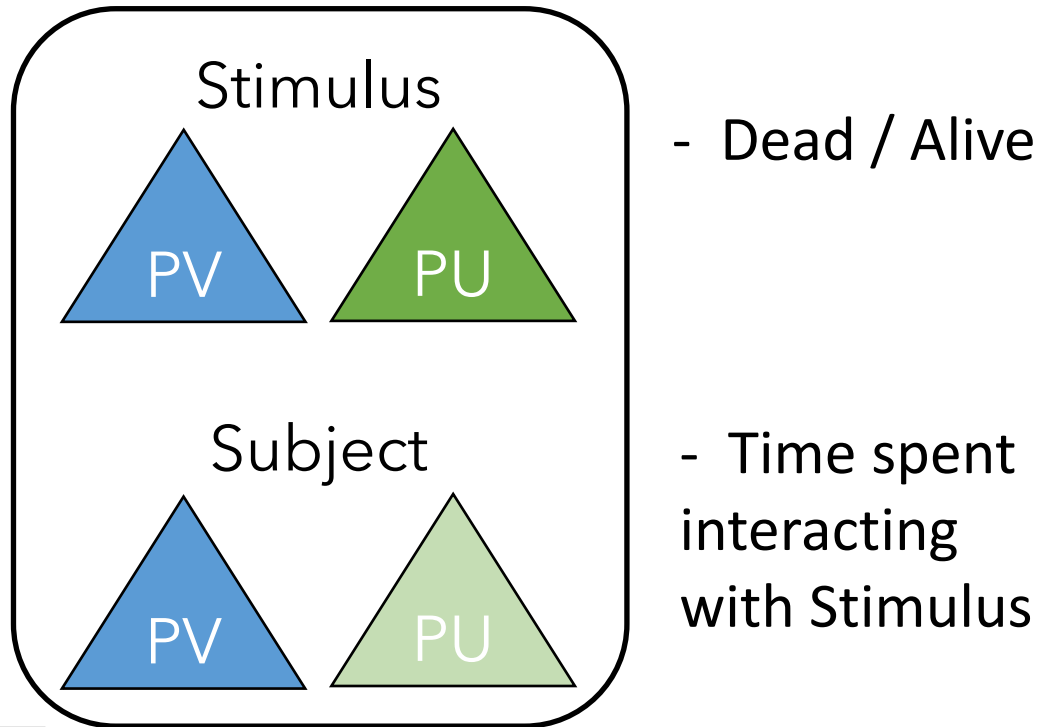
Evidence that *PU* may be aggressive



Lab expt: Role of trait-mediated interactions:

Little interaction with live PU

Mesocosm Experiment

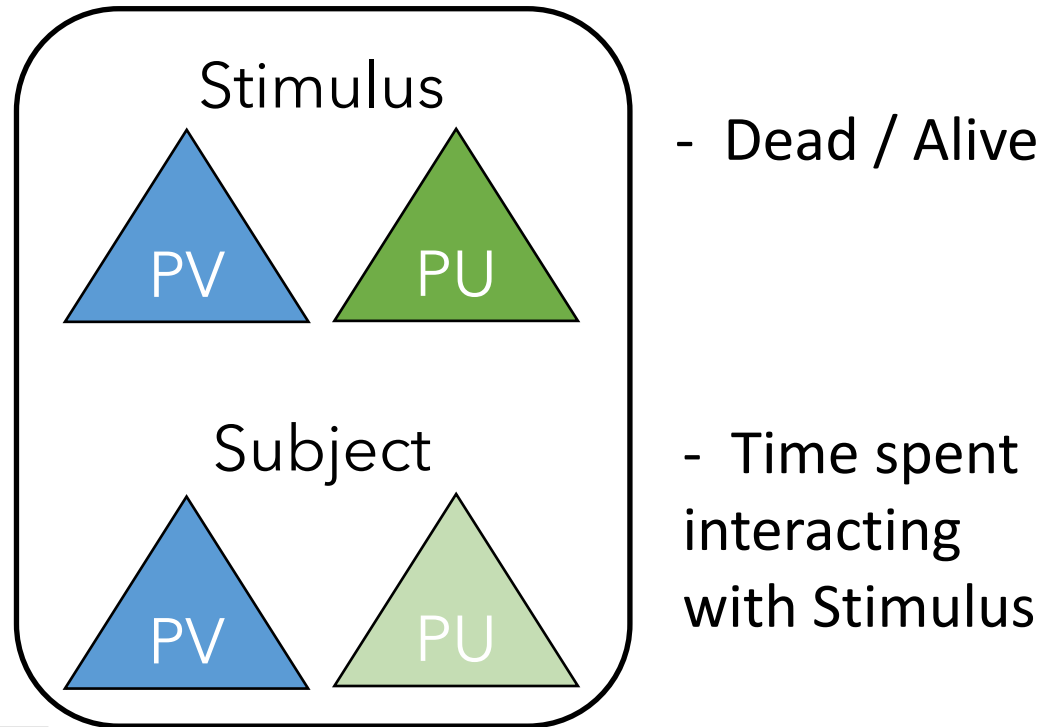


- Filmed for 6 hr (tidal cycle)

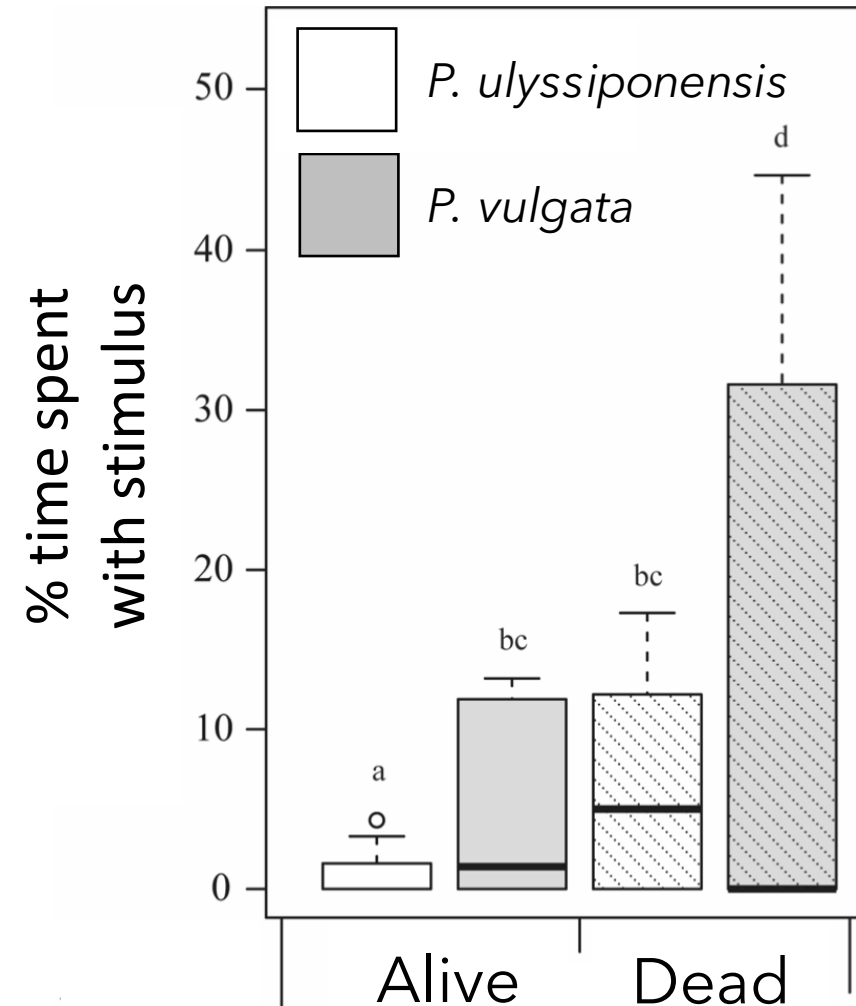
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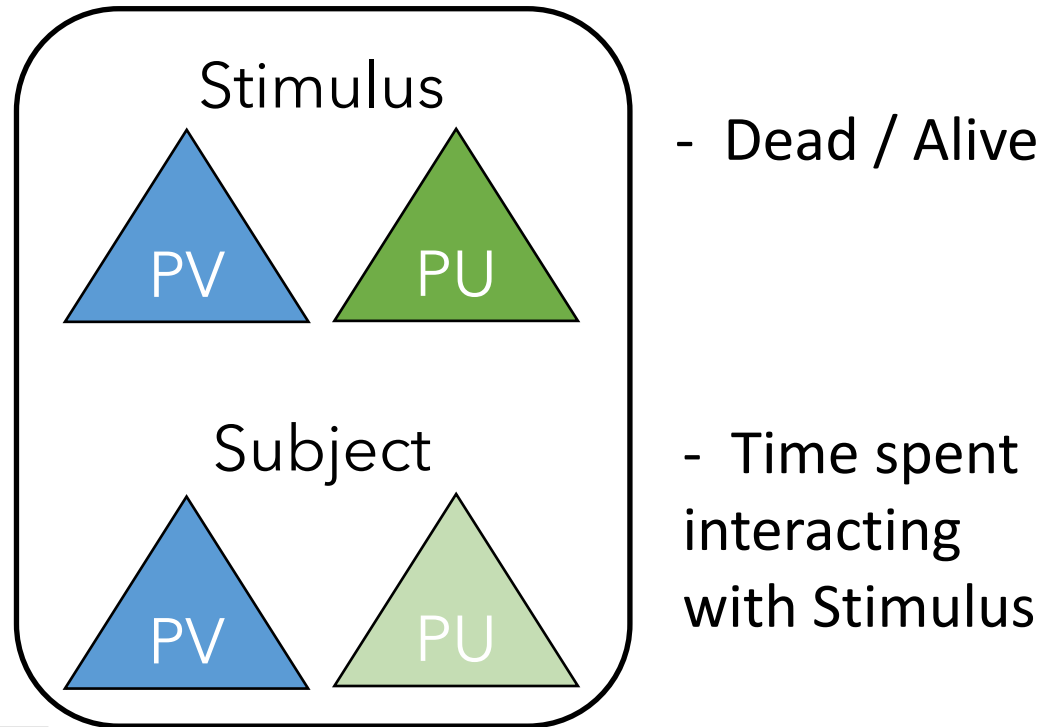
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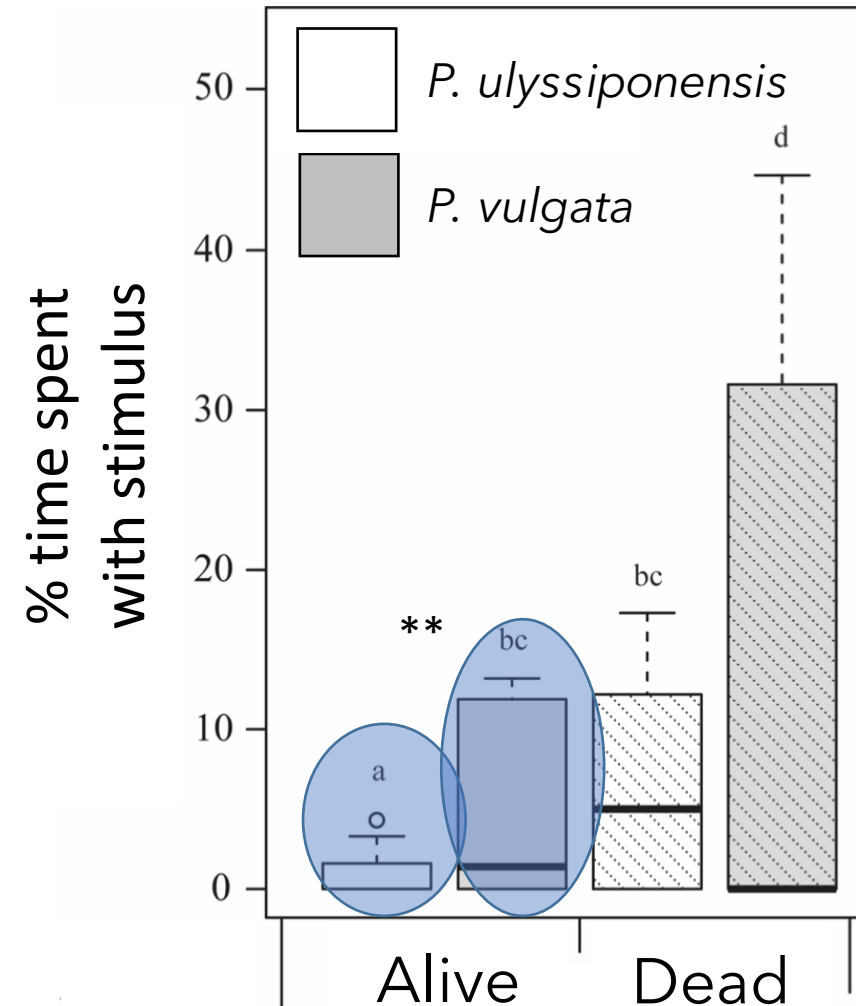
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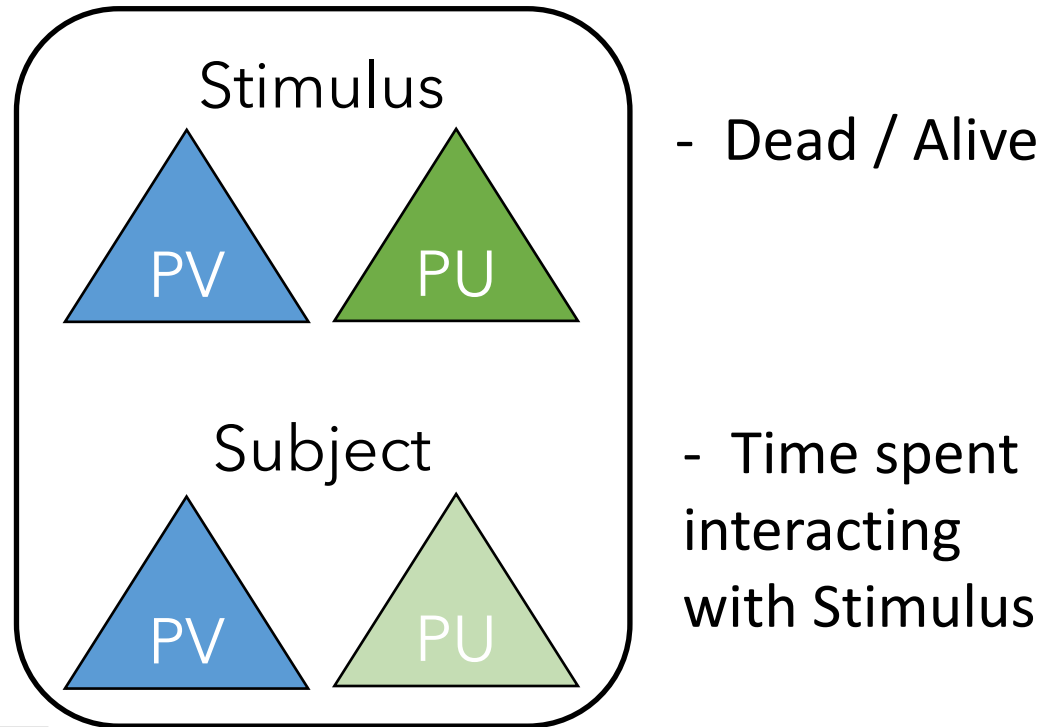
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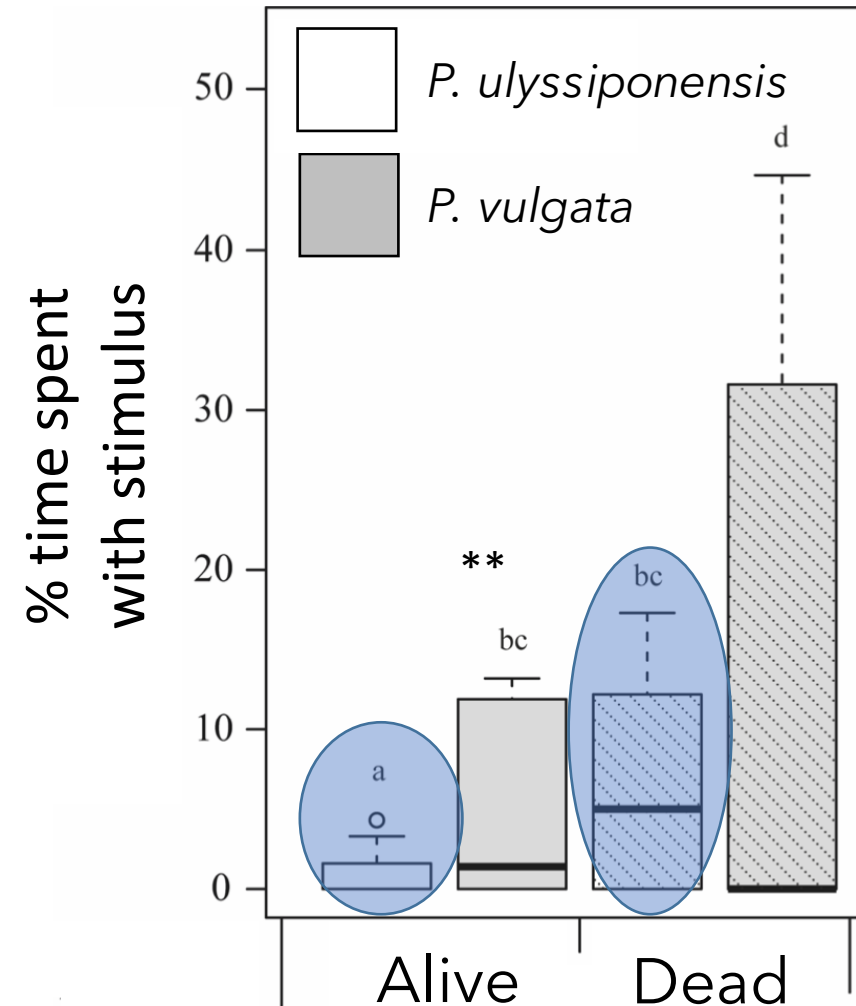
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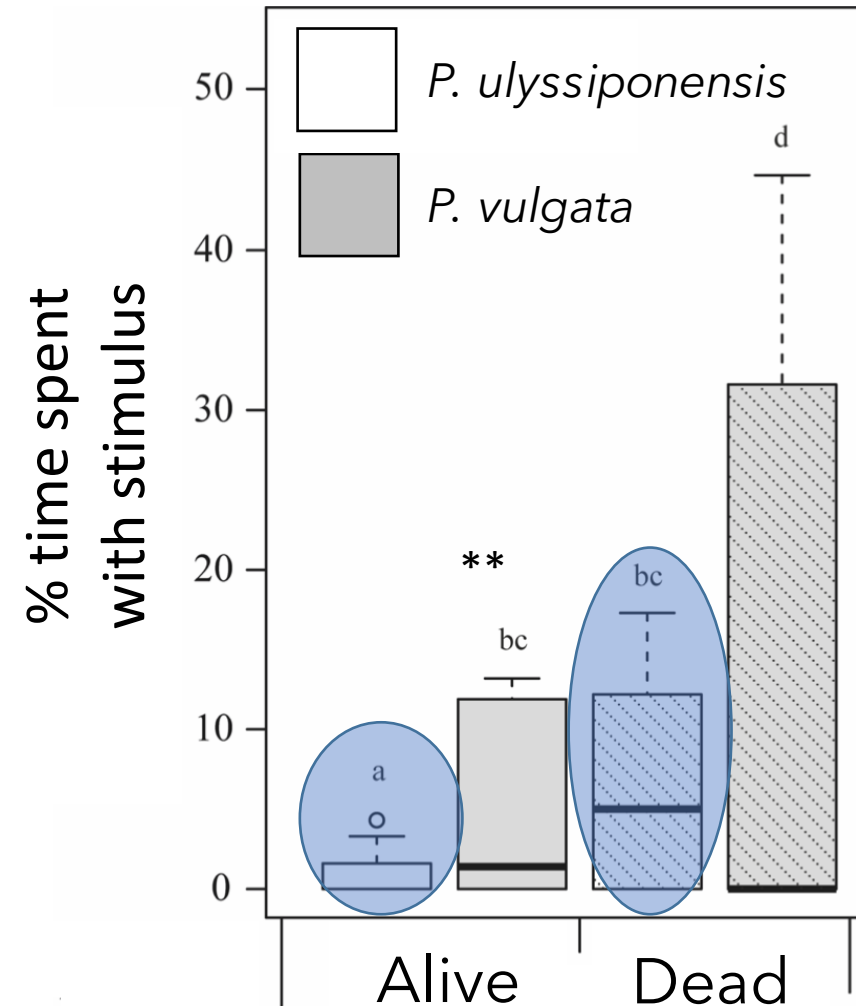
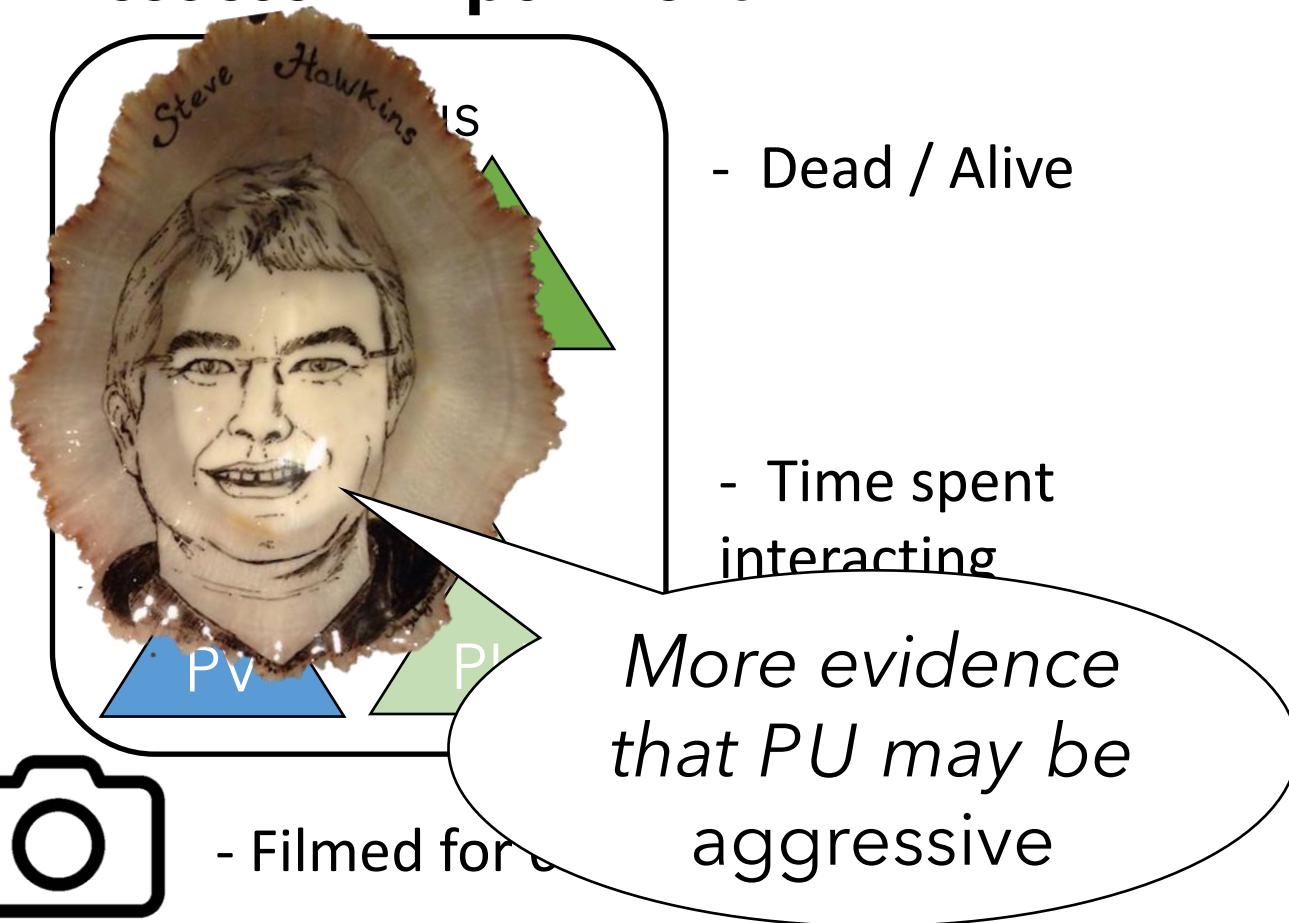
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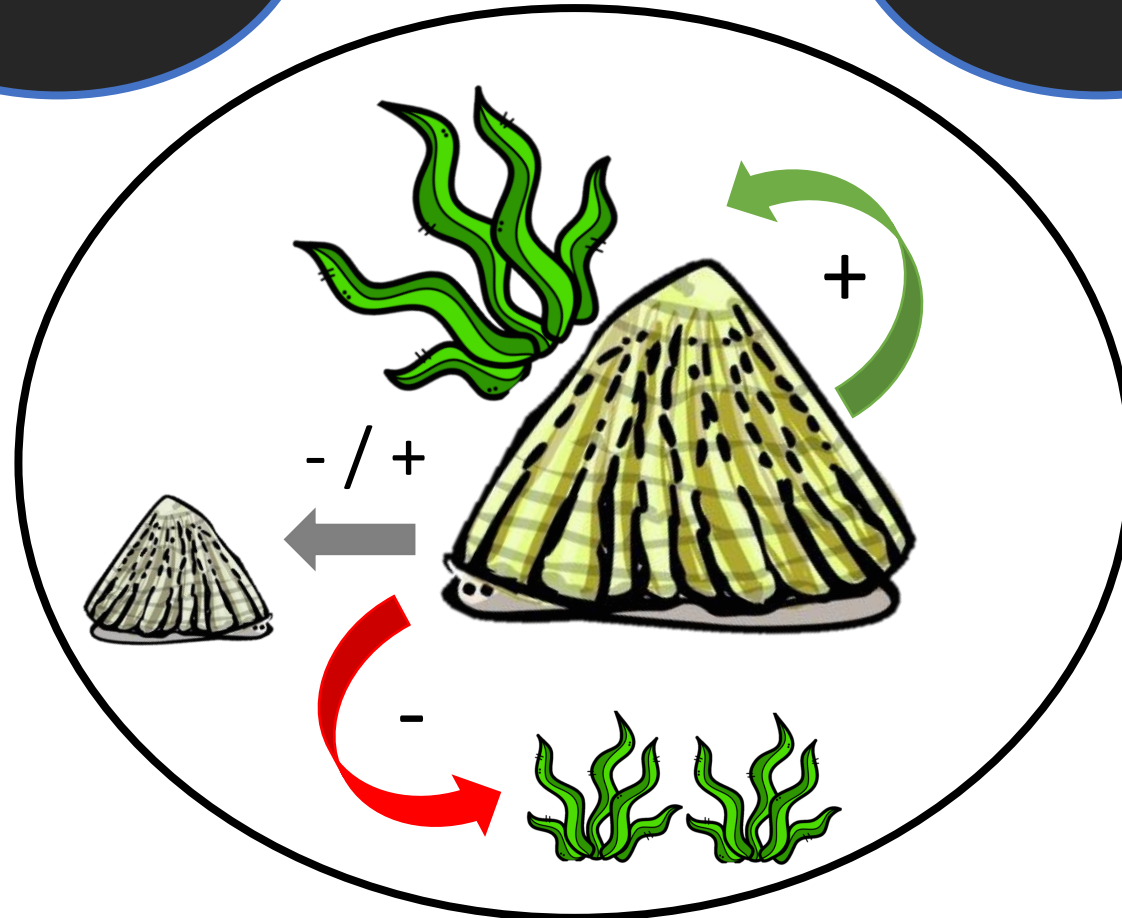
Only most resistant algae persist

Limpet BARRENS

Limpet ISLANDS

Behaviourally-mediated associational refuge

Limpets graze algae

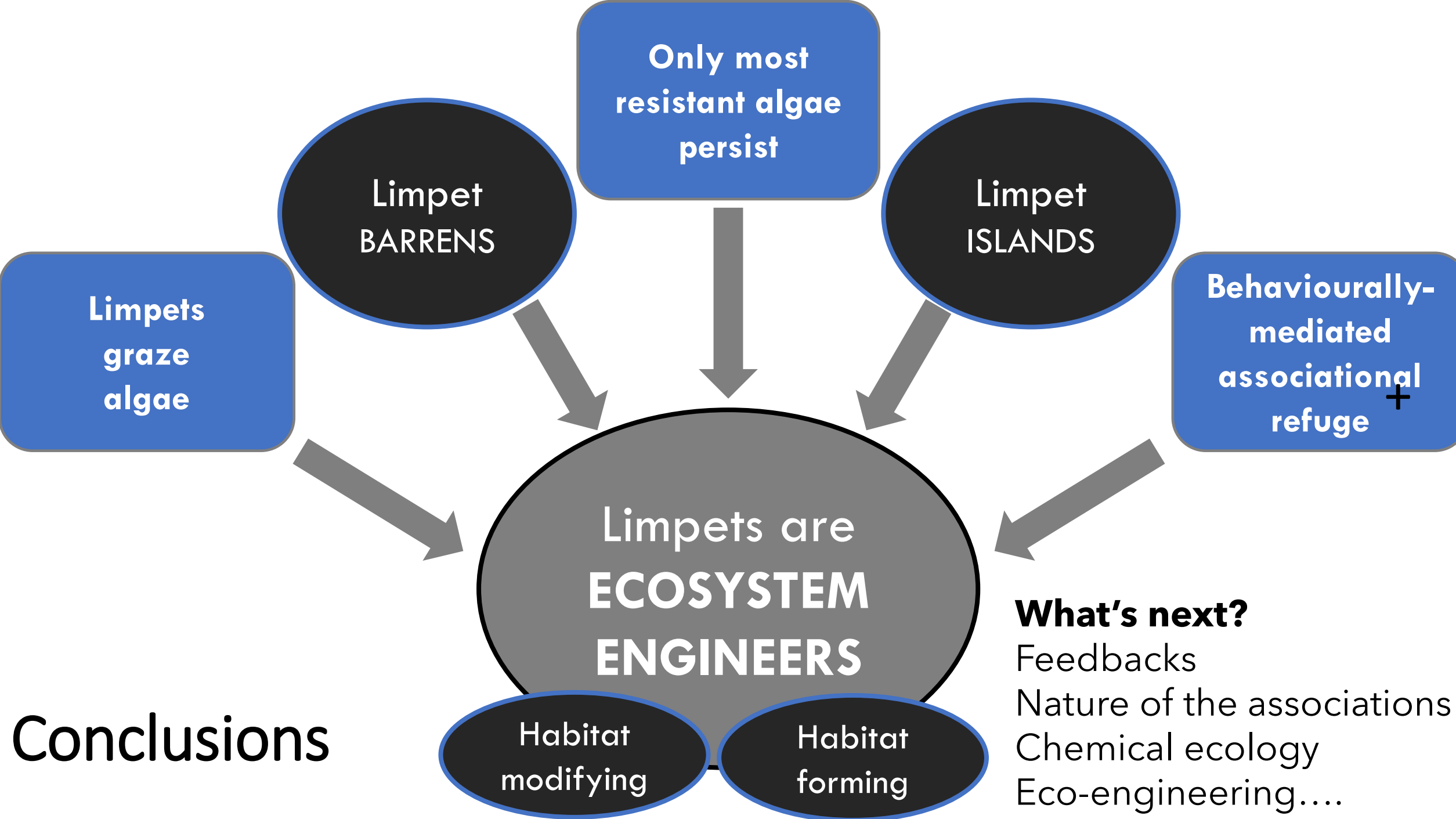


PU



PV

Discussion



Thank you for listening

Craig Johnson & ITRS team

All the co-authors

Instalment 1 of Operation “**Flying the flag for Limpets**”

Check out Instalment 2:

- poster on **LIMPETS IN OUR LIVES**

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FOUR-STAR FOCUS COLLECTION

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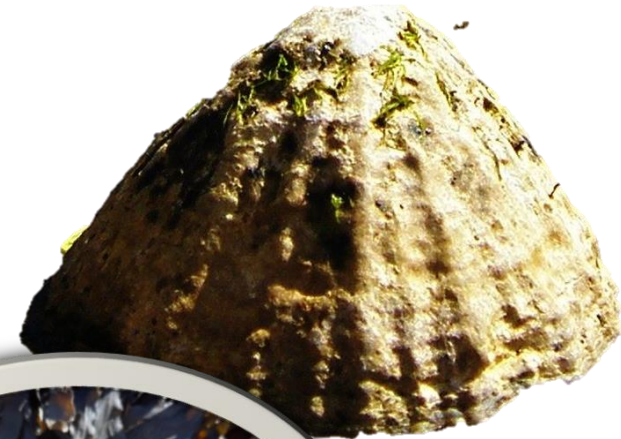


"PERHAPS THE GREAT SPY TALE OF OUR TIME."

- Kenneth Turan, Los Angeles Times

PATELLA ULYSSIPONENSIS
**GRAZER FACILITATOR
COMPETITOR ENGINEER**

PATELLA ULYSSIPONENSIS
**GRAZER FACILITATOR KILLER
ECOSYSTEM ENGINEER**



Perhaps the unsung hero of our time