

Ecology 4

- send answer to iClicker Question 32A now.
- "fitness" vs. fitness

Species Interactions 2

- Competition (-,-)
 - definition
 - consequences
- iClicker Question 32B

Bring Campbell

Due in lab **this** week:

- ⇒ Phylogenetic Collection
- ⇒ Animal Behavior Report

Will cover SimuText material
(see website for Ecology 2)

Final Exam Wednesday 5/19 11³⁰ - 2³⁰ (info in Ecology 5)

- Last names A - G in McCormack Cafe
- Last names H - Z here (1 bonus point for going to correct place!)

Current Research II due Wednesday May 5

Current Research III due Friday May 7

"Fitness" vs. fitness

"strength"
"health"
etc

↳ reproductive fitness - all that matters for evolution
of kids you have and/or
how well you pass on your genes

ex. deer with & without wolves - deers' fitness?

≠ consider 2 islands, each with food for 1000 deer ($K=1000$)

Island	#1 deer only	#2 deer + wolves	
# of deer	1000	750	lower because wolves eat deer
limit on deer population	starvation ∴	predation	
health of deer	weaker	stronger	∴ deer fitness lower with wolves b/c fewer deer of offspring
# of wolves	0	20 (wolves)	

Competition (-, -) in competing for same or overlapping resources,
both species' fitnesses decrease

ex Both GM (-) & other insects (-) eat leaves

- the more one species eats, the less there is for the other

∴ both reproduce less in presence of other

consequences ① Short term competitive exclusion

- 2 species cannot share the same limiting resource

- one always wins

⇒ leads to long term evolutionary effect

* character displacement / resource partitioning

2 species divide up the resource

ex. birds on islands eating different size seeds (fig 54.4)

⇒ Niche - the ecological "role" of an organism

= what it eats, where it lives, etc.

"how it makes a living"

ex. GM eat tree leaves in temperate climates

definitions

Fundamental Niche (FN) = the organisms' niche under
"ideal" conditions (no competition, predation, etc.)

Realized Niche (RN) = actual niche in nature

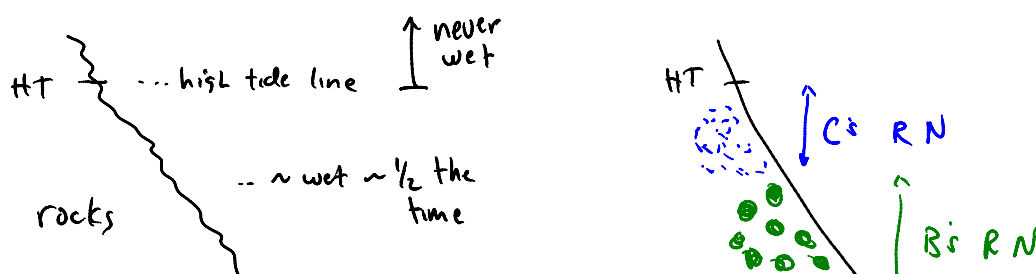
Intertidal zone



Barnacles



Rocky intertidal zone in nature (Scotland) fig 54.3



LT $\left\{ \begin{array}{l} \text{- low tide line} \\ \text{never dry} \end{array} \right.$

LT $\left\{ \begin{array}{l} \text{v} \end{array} \right.$

2 species of barnacles

• Chthamalus (C)

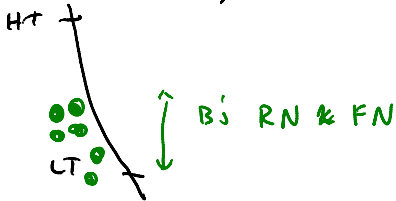
• Balanus (B)

Why this distribution?

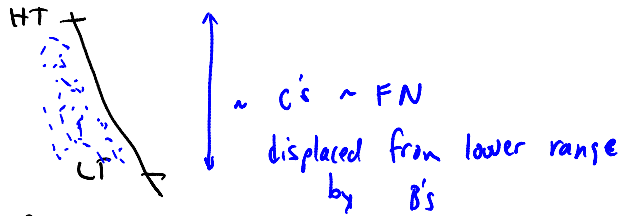
- suspect competition

experiments

remove C, wait



remove B, wait



conclusions: ① B excludes C from lower zone

"B reduces C's niche"

when B present, C reproduces less (-)

② when C present? B may reproduce less? (-, -) or (-, 0)

How? observe behavior

- if B next to C, as B grows, it prys C off rock

\therefore B 'wins' when niches overlap

Q: what sets upper bound of FN? - drying out

C can stand to be dryer than B

but both must be wet each day (H_2O : food)

Q: what sets lower bound of FN? - predation

* predators (sea urchins, fish, etc) need to stay wet

\therefore feed nearer LT line

\therefore maybe FN extends deeper (what does "ideal conditions" mean?)