## UNIT 6: Competition

#### Outline

#### Introduction

Population model with competition Balanced competition Unbalanced competition

# Population-level interactions Invasion theory

Colonization and co-existence

#### Niches and coexistence

The competitive exclusion principle

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The confused flour beetle

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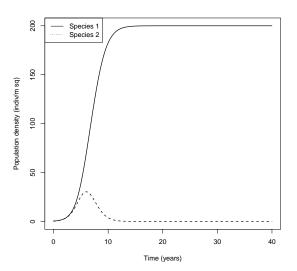
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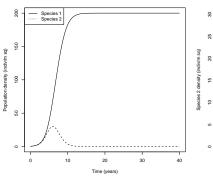
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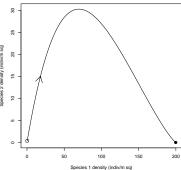
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# Dominance time plot

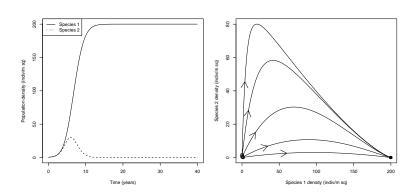


## Dominance phase plot

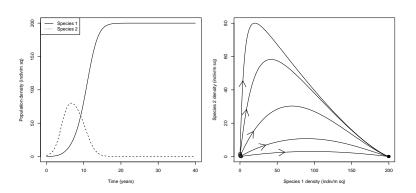




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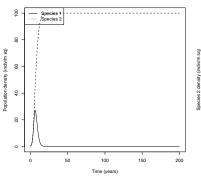
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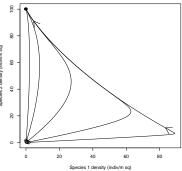
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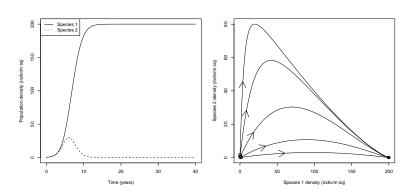
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# Dominance again





# What's the difference? (repeat)



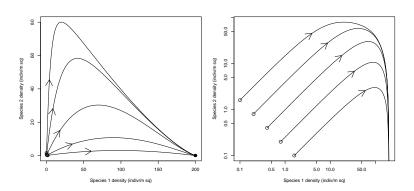
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#### Different scales



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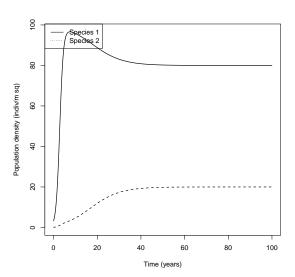
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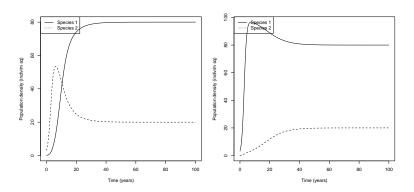
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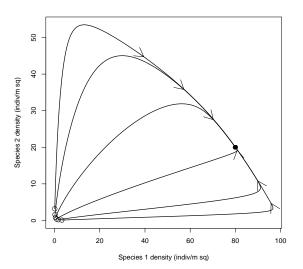




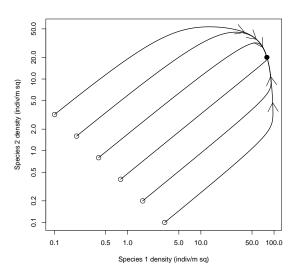




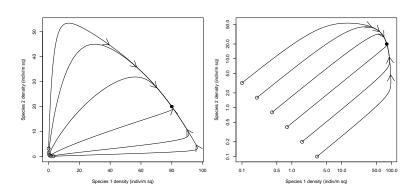
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## Coexistence phase plot (log scale)



# Coexistence phase plots



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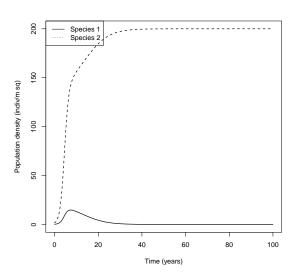
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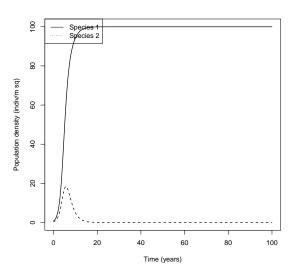


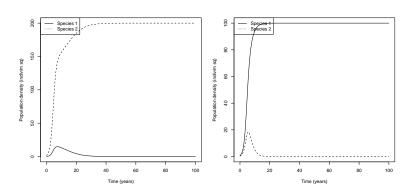
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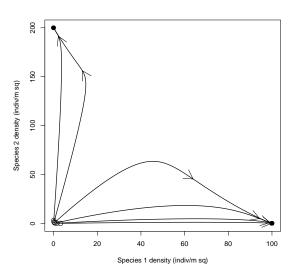
Changing the environment



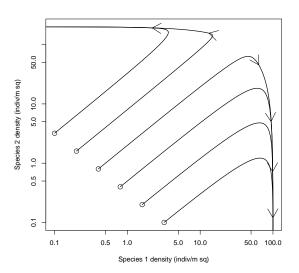




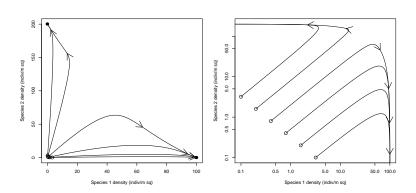
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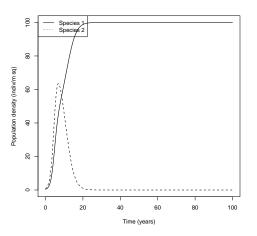
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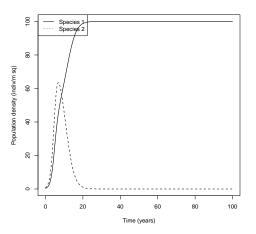


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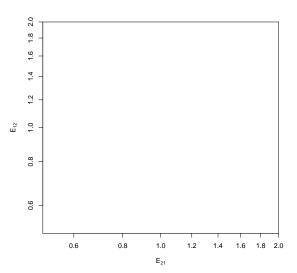
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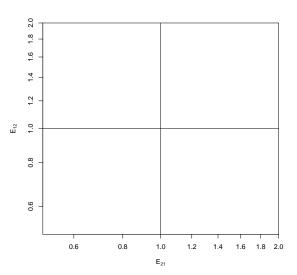
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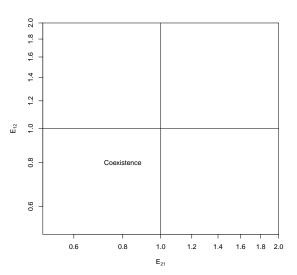
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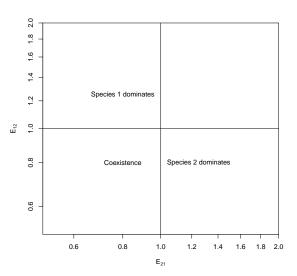
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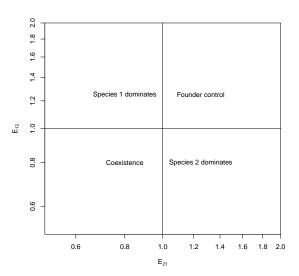
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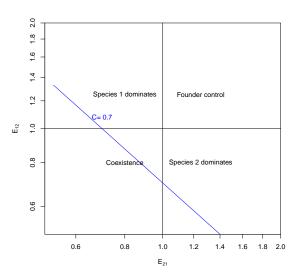


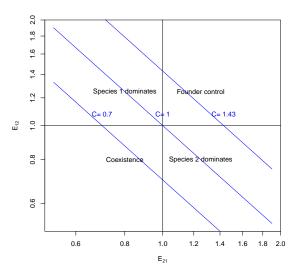












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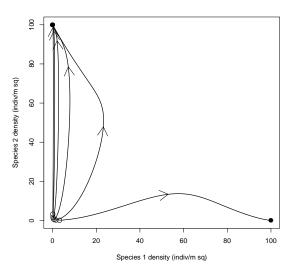
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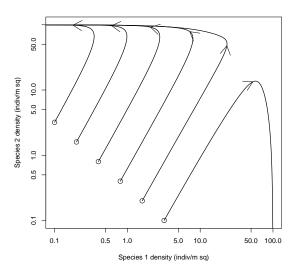
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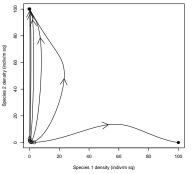
# Growth rate and founder control (repeat)

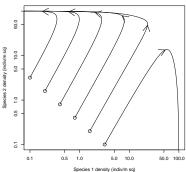


### Growth rate and founder control



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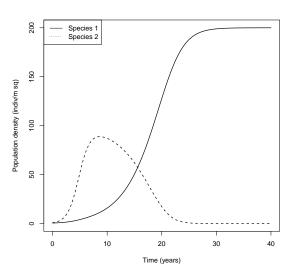
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# Example: chipmunks (repeat)



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- There are several species of chipmunks in the Sierra Nevada mountains
  - ► The most aggressive can only survive where the rainfall is good, and it out-competes all the other species
  - ► The least aggressive can survive anywhere in the mountain range, but it cannot co-exist with any of the other species
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#### Outline

#### Introduction

Population model with competition Balanced competition Unbalanced competition

Population-level interactions
Invasion theory
Colonization and co-existence

Niches and coexistence

The competitive exclusion principle

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