BIOl 410 Tutorial 6

Metapopulation

Q1
You are studying competition between red and
black desert scorpions. For the red scorpion,
K1
 = 100 and α = 2. For the black scorpion, K2
 =
150 and β= 3.

Suppose the initial population size are 25 red
scorpions and 50 black scorpions. Graph the
stat space and isoclines for each species, and
plot these initial population sizes. Predict the
short-term dynamics of each population and
the final outcome of interspecific competition.

Q2
Suppose that , for two competing
species, α = 1.5, β = 0
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Q3

Diagram the state space for two

competing species in which there is a

stable equilibrium. Show how intraguild

predation could shift this to exclusion by

the predatory species.

Q4

Suppose that spider and fly populations

are governed by Lotka-Volterra

dynamics, with the following

coefficients: r = 0.1, q = 0.5, α = β =

0.001. If the initial population sizes are

200 spiders and 600 flies, what are the

short-ter m population dyn amics

predicted by the model?

Q5

Suppose that hawk and dove

populations cycle with a peak every

10 years, and r = 0.5. If q is doubled

in size, what happens to the period

of the cycle?