Formulas

discrete time growth:

- $N_T = N_0\lambda^T$
- $\lambda = f + p$
- $\mathcal{R} = f/(1-p)$

continuous time growth:

- $N(t) = N(0)\exp(rt)$
- $r = b - d$
- $\mathcal{R} = b/d$

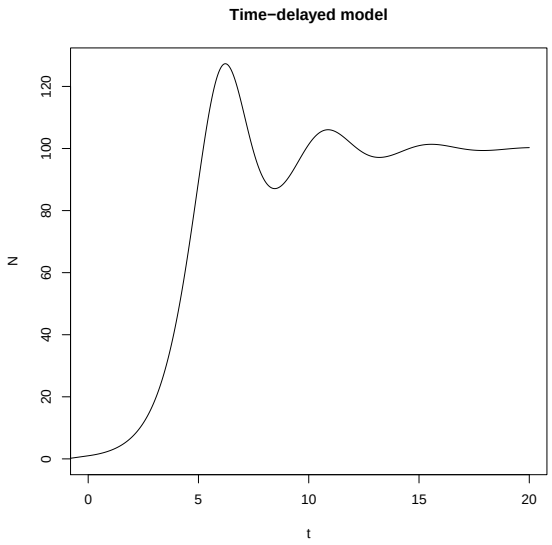
structured growth:

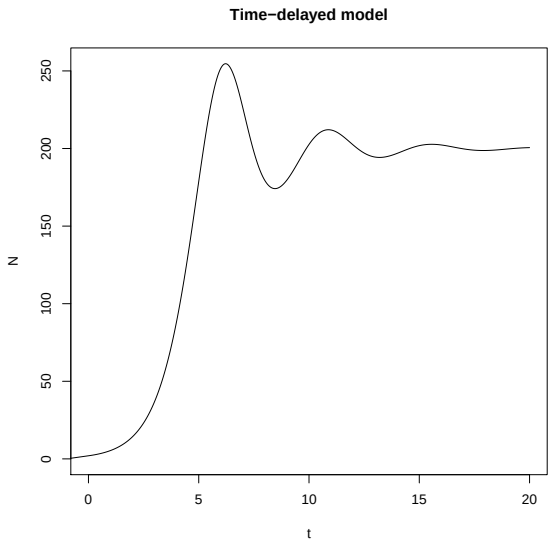
- $\ell_x = p_1 \times p_2 \times \ldots p_{x-1}$
- $\mathcal{R} = \sum \ell_x f_x$
- $\sum \ell_x f_x \lambda^{-x} = 1$
- $\text{SAD}(x) \propto \ell_x \lambda^{-x}$

competition:

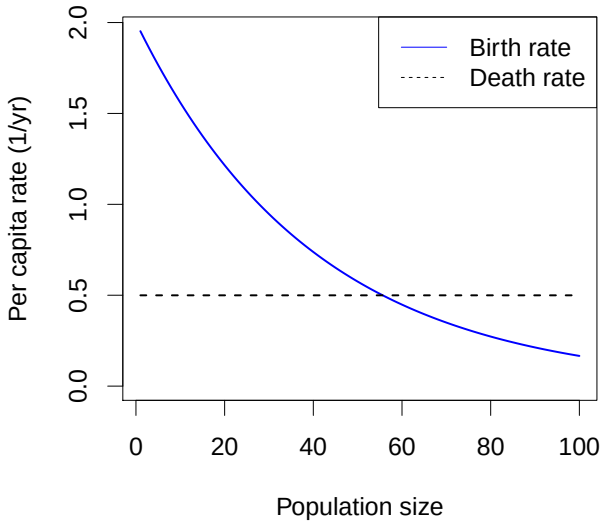
- α_{ij} = effect **of** species i **on** species j
- $C = \alpha_{12}\alpha_{21}$
- $E_{ij} = \alpha_{ij}K_i/K_j$

Delay

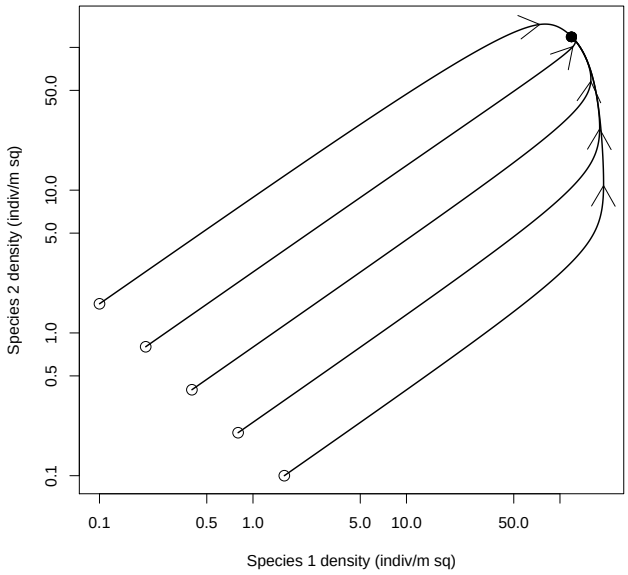


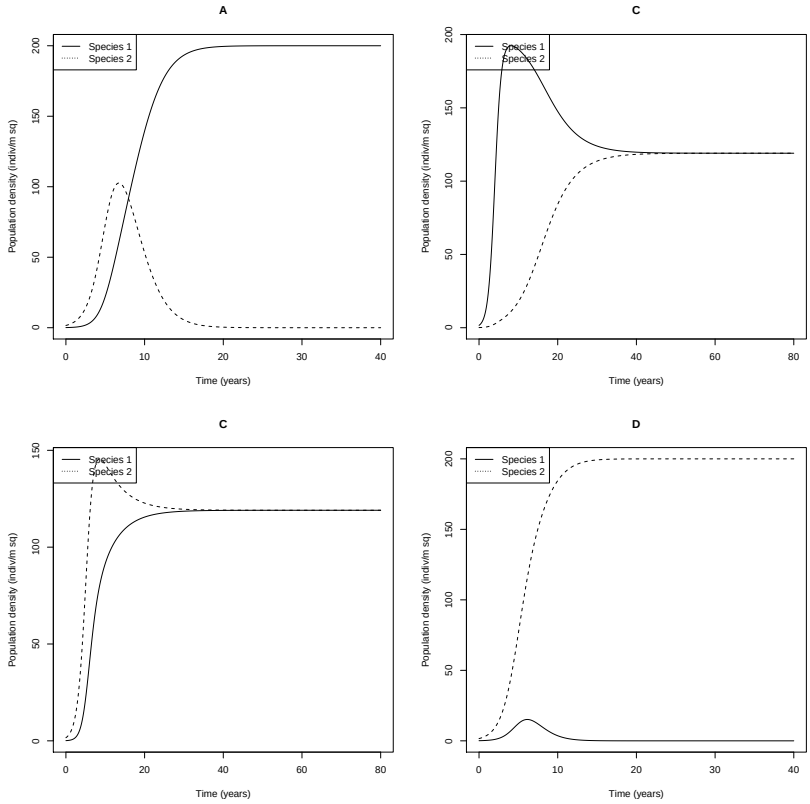


Vital Rates

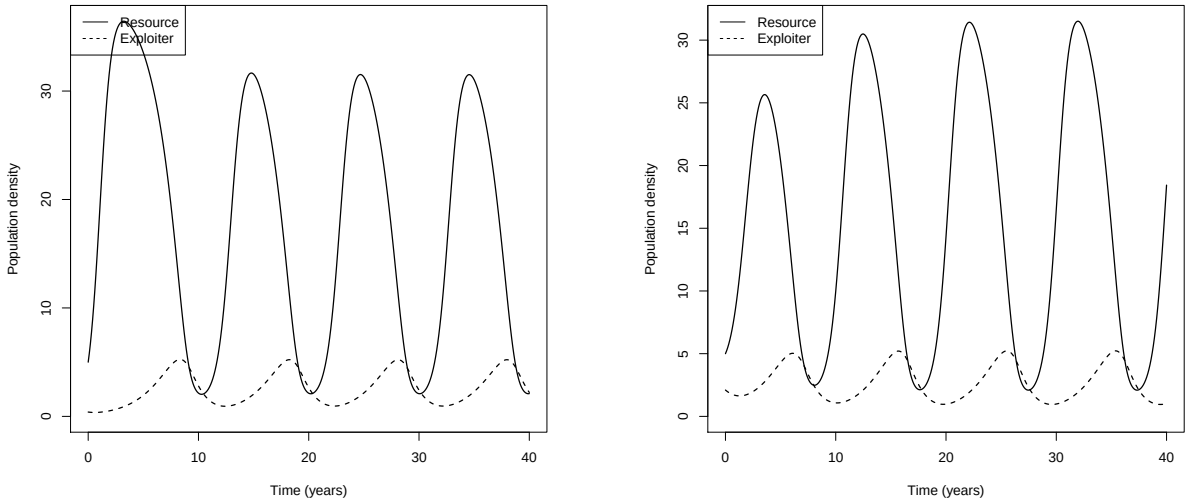


Competition





Exploitation



Spread