tables

Ave Bisesi

2023-04-04

Basic model parameters

Table 1: Model parameters, default values, and descriptions.

Parameter	Default Value	Description
$\alpha_{j,i}$	1.0	Cooperation coefficient, benefit of host species i to host species j
$\beta_{j,i}$	0.9	Competition coefficient, effect of host species i on host species j
μ_i	0.5	Intrinsic growth rate of host species i
$\gamma_{i,x}$	20	Burst size of phage with range x on host species i
$\zeta_{i,x}$	0.001	Attachment rate of phage with range x on host species i
δ_i	0.03	Natural rate of death for species i
κ_i	1.0	Half-saturation Monod constant of species i
R	1.0 (coop) or 2.0 (comp)	System carrying capacity

Parameter combinations tested

Morris and Sobol Screening Parameters

Table 2: Parameter trade-offs tested in our model.

Trade-off	Parameter Combinations	Significance
None	$\gamma_{i,2} = \gamma_{i,1}$ and $\zeta_{i,2} = \zeta_{i,1}$	Generalist and specialist predators are parametrically identical
Cost of generalism	$\gamma_{i,2} \neq \gamma_{i,1}$ or $\zeta_{i,2} \neq \zeta_{i,1}$	Specialist and generalist phage differ in their ability to kill hosts
Interaction outcome	$\mu_i \neq \mu_j$ or $\beta_{i,j} \neq \beta_{j,i}$ or $\alpha_{i,j} \neq \alpha_{j,i}$	Prey species coexistence in the absence of phage is biased or impossible
Cost of generalism and interaction outcome	$\gamma_{i,2} \neq \gamma_{i,1}$ and $\mu_i \neq \mu_j$ or $\gamma_{i,2} \neq \gamma_{i,1}$ and $\beta_{i,j} \neq \beta_{j,i}$ or $\gamma_{i,2} \neq \gamma_{i,1}$ and $\alpha_{i,j} \neq \alpha_{j,i}$ or $\zeta_{i,2} \neq \zeta_{i,1}$ and $\mu_i \neq \mu_j$ or $\zeta_{i,2} \neq \zeta_{i,1}$ and $\beta_{i,j} \neq \beta_{j,i}$ or $\zeta_{i,2} \neq \zeta_{i,1}$ and $\alpha_{i,j} \neq \alpha_{j,i}$	Specialist and generalist phage differ in their ability to kill hosts and host species coexistence in the absence of phage is biased or impossible

Table 3: Morris screening and Sobol' variance sensitivity analysis parameter ranges.

Parameter	Minimum	Maximum
$\alpha_{j,i}$	0.1	2.5
$\beta_{j,i}$	0.1	2.5
μ_i	0.1	2.5
$\gamma_{i,x}$	15	65
$\zeta_{i,x}$	0.0009	0.01
δ_i	0.0009	0.1
κ_i	0.1	10
R	0	5