

tables

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## 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 $j$
$\mu_i$	0.5	Intrinsic growth rate of host species $i$
$\gamma_{i,x}$	20	Efficiency of predator with range $x$ on host species $i$
$\zeta_{i,x}$	0.001	Consumption rate of predator with range $x$ on host species $i$
$\delta_i$	0.03	Natural rate of death for species $i$
$\kappa_i$	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 predators 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 predators 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 predators differ in their ability to kill hosts and prey species coexistence in the absence of predators 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
$\mu_i$	0.1	2.5
$\gamma_{i,x}$	15	65
$\zeta_{i,x}$	0.0009	0.01
$\delta_i$	0.0009	0.1
$\kappa_i$	0.1	10
R	0	5