

Supplementary Materials for:

Ecosystem size and complexity are extrinsic drivers of food chain length in branching networks

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Table S1 Sensitivity analysis for ecosystem size

Sensitivity analysis of the ecosystem size effect on the FCL. Parameter estimates of linear regression models are shown. Response variables are Spearman's rank correlation between food chain length and ecosystem size. Response and explanatory variables (i.e., simulation parameters) were standardized (mean = 0, SD = 1) before the analysis.

Term	Interpretation	Estimate	SE
p_m	Disturbance prob.	0.034	0.038
μ_m	Disturbance intensity	0.091	0.039
σ_s	Disturbance variation at headwaters	0.003	0.039
σ_l	Local disturbance variation	0.024	0.039
r_b	Reproductive rate of basal species	-0.066	0.038
e_{bc}	Conversion efficiency (B to C)	-0.216	0.038
e_{bp}	Conversion efficiency (B to P)	-0.027	0.039
e_{cp}	Conversion efficiency (C to P)	0.003	0.038
a_{bc}	Attack rate (B to C)	-0.184	0.038
a_{bp}	Attack rate (B to P)	0.152	0.038
a_{cp}	Attack rate (C to P)	-0.214	0.038
h_{bc}	Handling time (B to C)	0.045	0.039
h_{bp}	Handling time (B to P)	0.264	0.039
h_{cp}	Handling time (C to P)	-0.249	0.039
s_0	Survival prob.	-0.067	0.039
p_d	Dispersal prob.	-0.003	0.038
θ	Dispersal distance	0.035	0.039

Table S2 Sensitivity analysis for ecosystem complexity

Sensitivity analysis of the ecosystem complexity effect on the FCL. Parameter estimates of linear regression models are shown. Response variables are Spearman's rank correlation between food chain length and ecosystem complexity. Response and explanatory variables (i.e., simulation parameters) were standardized (mean = 0, SD = 1) before the analysis.

Term	Interpretation	Estimate	SE
p_m	Disturbance prob.	-0.007	0.036
μ_m	Disturbance intensity	-0.037	0.036
σ_s	Disturbance variation at headwaters	0.019	0.036
σ_l	Local disturbance variation	0.031	0.036
r_b	Reproductive rate of basal species	0.121	0.036
e_{bc}	Conversion efficiency (B to C)	0.270	0.036
e_{bp}	Conversion efficiency (B to P)	0.053	0.036
e_{cp}	Conversion efficiency (C to P)	0.002	0.036
a_{bc}	Attack rate (B to C)	0.187	0.036
a_{bp}	Attack rate (B to P)	-0.193	0.036
a_{cp}	Attack rate (C to P)	0.249	0.036
h_{bc}	Handling time (B to C)	-0.100	0.036
h_{bp}	Handling time (B to P)	-0.244	0.037
h_{cp}	Handling time (C to P)	0.280	0.037
s_0	Survival prob.	0.078	0.036
p_d	Dispersal prob.	-0.004	0.036
θ	Dispersal distance	-0.004	0.036