Appendix 1

Table A1 (a separate file: Table A1.xls); Summary of abiotic and biotic selection effects on stoichiometric traits across taxa.

Table A2 (a separate file: Table A1references.doc): References to Table A1.

Figure A1: Increasing additive genetic variance ($v$) destabilizes population dynamics.

Figure A2: Increasing the maximum value of P:C ($\theta_{\text{max}}$) can cause evolutionary rescue when the producer carrying capacity ($K$) is very small.

Figure A3: Decreasing the minimum value of P:C ($\theta_{\text{min}}$) can cause evolutionary rescue when the producer carrying capacity ($K$) is large.

Figure A4: The convex tradeoff function can destabilize dynamics and the concave tradeoff function can cause bistability.

Figure A5: An example of chaotic dynamics in the quantitative genetic model with the period-doubling bifurcation.
$v = 0.1$

$\nu = 0.5$

$\nu = 1$

$\nu = 2$

$\nu = 10$
Figure A1. Increasing additive genetic variance ($v$) destabilizes population dynamics. Bifurcation diagrams of consumer density (A, C, E, G, I) and consumer P:C ratio (B, D, F, H, J) along the carrying capacity ($K$). (A, B): $v = 0.1$, (C, D): $v = 0.5$, (E, F): $v = 1$, (G, H): $v = 2$, (I, J): $v = 10$. 
Figure A2. Increasing the maximum value of P:C ($\theta_{\text{max}}$) can cause evolutionary rescue when the producer carrying capacity ($K$) is very small. Bifurcation diagrams of consumer density (A, C, E) and consumer P:C ratio (B, D, F) along the carrying capacity ($K$). (A, B): $\theta_{\text{max}} = 0.031$, (C, D): $\theta_{\text{max}} = 0.05$, (E, F): $\theta_{\text{max}} = 0.1$. 
\( \theta_{\text{min}} = 0.0 \)

\( \theta_{\text{min}} = 0.010 \)

\( \theta_{\text{min}} = 0.015 \)

\( \theta_{\text{min}} = 0.020 \)

\( \theta_{\text{min}} = 0.025 \)
Figure A3. Decreasing the minimum value of P:C ($\theta_{\text{min}}$) can cause evolutionary rescue when the producer carrying capacity ($K$) is large. Bifurcation diagrams of consumer density (A, C, E, G, I) and consumer P:C ratio (B, D, F, H, J) along the carrying capacity ($K$). (A, B): $\theta_{\text{min}} = 0$, (C, D): $\theta_{\text{min}} = 0.01$, (E, F): $\theta_{\text{min}} = 0.015$, (G, H): $\theta_{\text{min}} = 0.02$, (I, J): $\theta_{\text{min}} = 0.025$. 
Figure A4. The convex tradeoff function can destabilize dynamics and the concave tradeoff function can cause bistability. Bifurcation diagrams of consumer density (A, C, E, G) and consumer P:C ratio (B, D, F, H) along the carrying capacity ($K$). We assumed a convex tradeoff function as $c = -1378(\theta - 0.03)^2 + 0.81$ and a concave function as $c = 1378(\theta - 0.015)^2 + 0.5$ with $\theta_{\text{max}} = 0.03$ and $\theta_{\text{min}} = 0.015$. (A, B): the convex tradeoff function, (C, D):
the linear tradeoff function, (E, F): the concave tradeoff function with the initial $\theta = 0.016$, (G, H): the concave tradeoff function with the initial $\theta = 0.029$. 
Figure A5. An example of chaotic dynamics in the quantitative genetic model with the period-doubling bifurcation. Parameter values are $K = 1.14$, $\theta_{\text{max}} = 0.05$ for (A) and $\nu = 0.9$ for (B-E). (A): a bifurcation diagram with local maximum and minimum consumer density along the additive genetic variance ($\nu$). (B): time-series of chaotic dynamics. Black lines: producer density, red lines: consumer density, blue lines: 10 times consumer P:C ratio ($\theta$). (C-E): dynamics with producer and consumer densities (C), producer density and consumer P:C ratio (D), and consumer density and consumer P:C ratio (E).