Fig-2-equations

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Cooperation

$$E^* = \frac{\delta \times (\gamma_{s,2} + \gamma_{s,1})}{\gamma_{s,1} \times \gamma_{e,2}}$$

$$S^* = \frac{\delta_p}{\gamma_{s,1}}$$

$$gen^* = \frac{(-\delta \times \gamma_{e,2} \times \gamma_{s,1}) + (1 + \kappa_e) \times \mu_e \times (\delta \times (\gamma_{s,2} - \gamma_{s,1}) + (\gamma_{e,2} \times \gamma_{s,1} \times R))}{\gamma_{e,2} \times \gamma_{s,1} \times \zeta_{e,2}}$$

$$sp^* = \frac{(\gamma_{e,2} \times \gamma_{s,1} \times R \times ((1 + \kappa_s) \times \mu_s \times \zeta_{e,2} - (1 + \kappa_e) \times \mu_e \times \zeta_{s,2}) - \delta \times (\gamma_{e,2} \times (1 + \kappa_s) \times \mu_s \times \zeta_{e,2} + \gamma_{e,2} \times \gamma_{s,1} \times (\zeta_{e,2} - \zeta_{s,2}) +}{\gamma_{e,2} \times \gamma_{s,1} \times \zeta_{e,2} \times \zeta_{s,1}}$$

Competition

$$E^* = \frac{\delta \times (\gamma_{s,2} + \gamma_{s,1})}{\gamma_{s,1} \times \gamma_{e,2}}$$

$$S^* = \frac{\delta_p}{\gamma_{s,1}}$$

$$\frac{dsp}{dt} = (\gamma_{s,1} \times sp \times S) - (\delta_p * sp)$$

$$gen^* = \frac{(-\delta \times ((-\gamma_{s,2} + \gamma_{s,1}) \times (\mu_e + \gamma_{e,2} \times (\gamma_{s,1} + \beta_{e,s} \times \mu_e)) + (\gamma_{e,2} \times \gamma_{s,1} \times \mu_e \times R))}{\gamma_{e,2} \times \gamma_{s,1} \times \zeta_{e,2}}$$