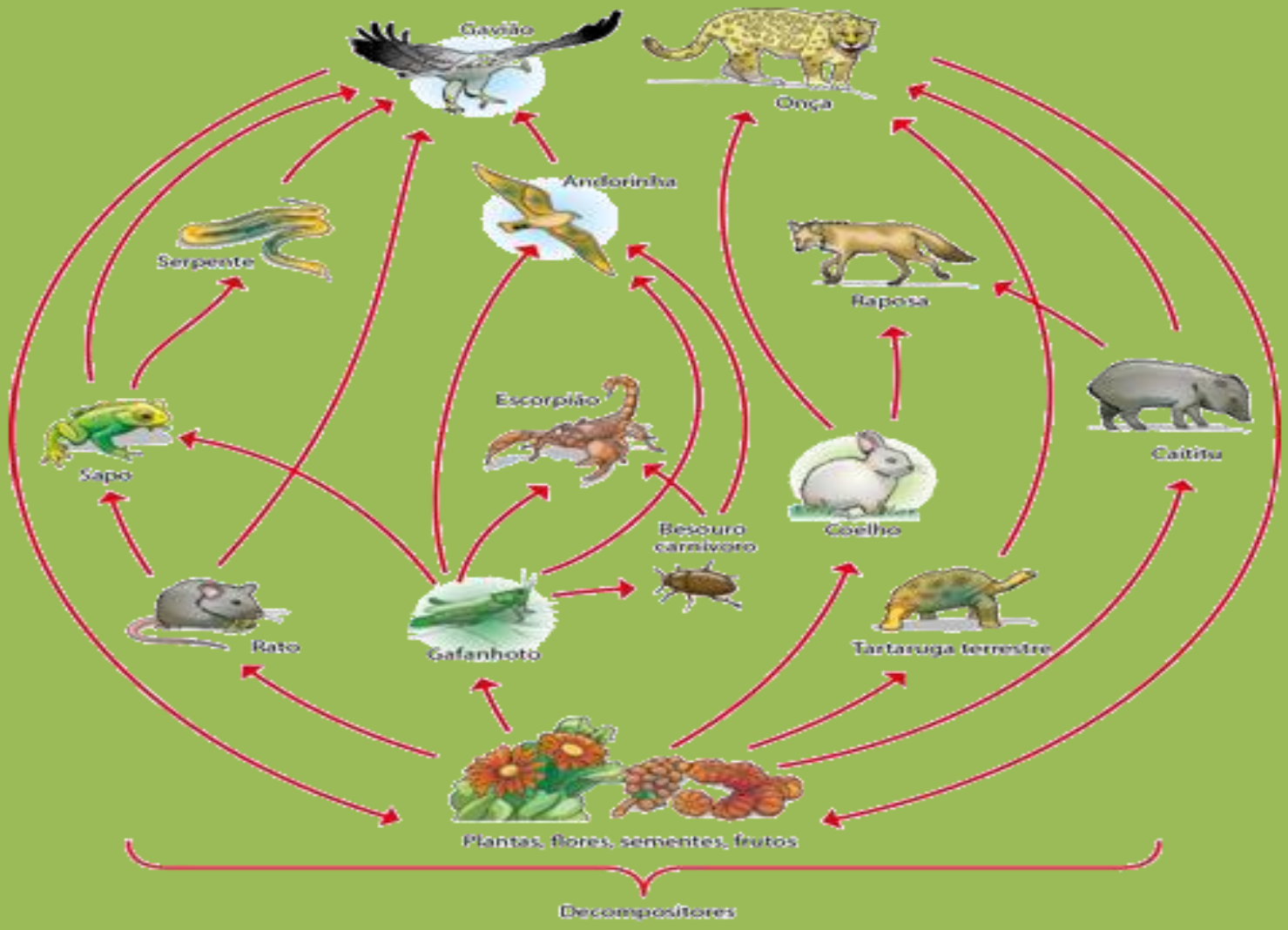
Redes Tróficas

Rede Trófica



Modelo de Malthus (Ambiente Ideal)

$$\frac{(k-1)}{\Delta t} = \alpha$$

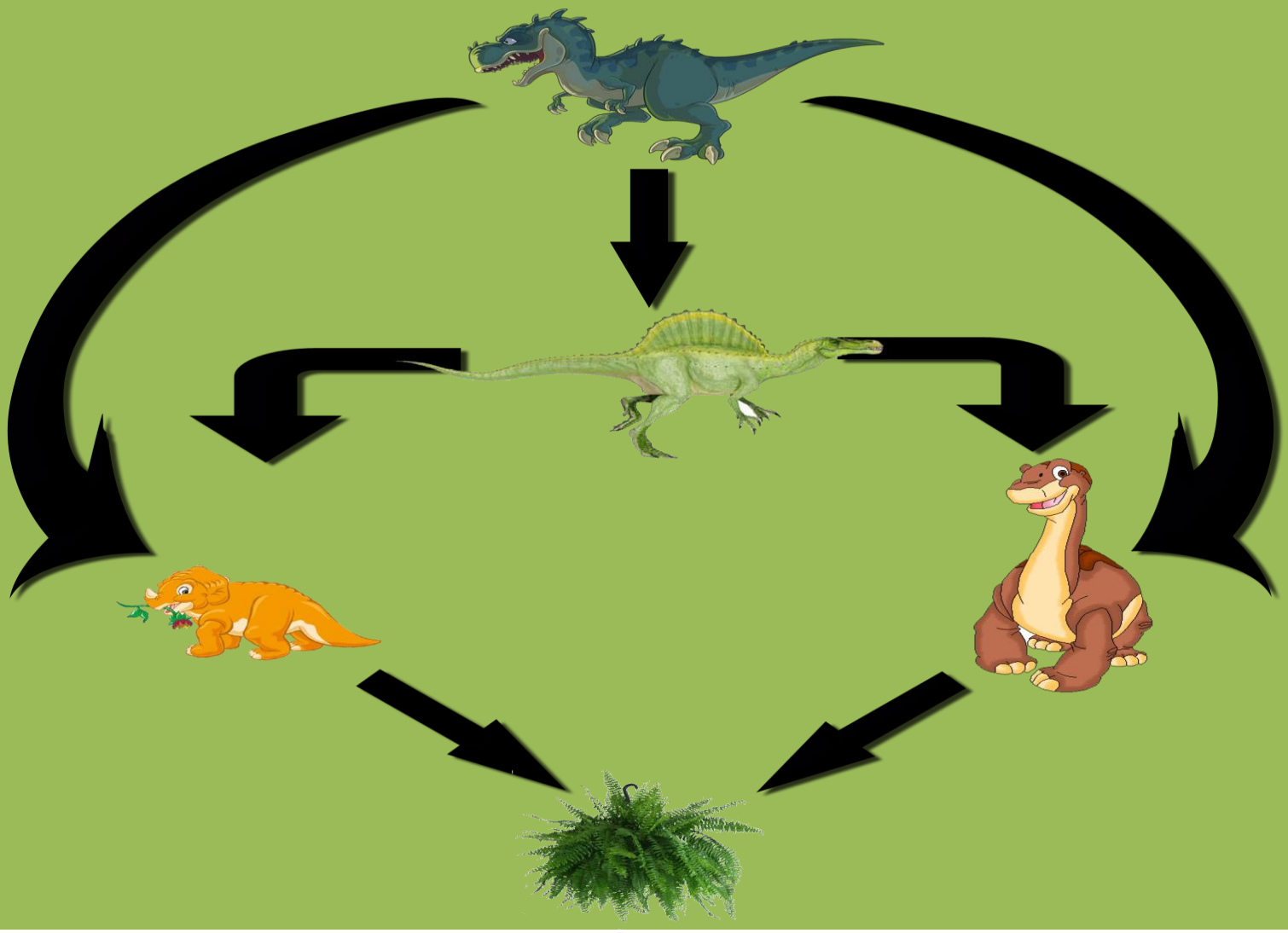
$$\frac{dN(t)}{dt} = \alpha N(t)$$

O mundo real nem sempre é "ideal"

$$\frac{dN(t)}{dt} = \alpha N(t) - \text{Fatores Limitantes}$$

O Vale Encantado

Rede trófica - Vale encantado



Modelo Lotka -Volterra

Equações de Lotka - Volterra

$$\frac{dP}{dt} = P(\alpha V - \beta)$$

$$\frac{dV}{dt} = V(\lambda - \varphi P)$$

Equações - Vale Encantado

$$\Delta S = S\left(F - \frac{F \cdot S}{\kappa} - \gamma_0 \cdot A - \gamma_1 \cdot T - \omega\right) \cdot \Delta X$$

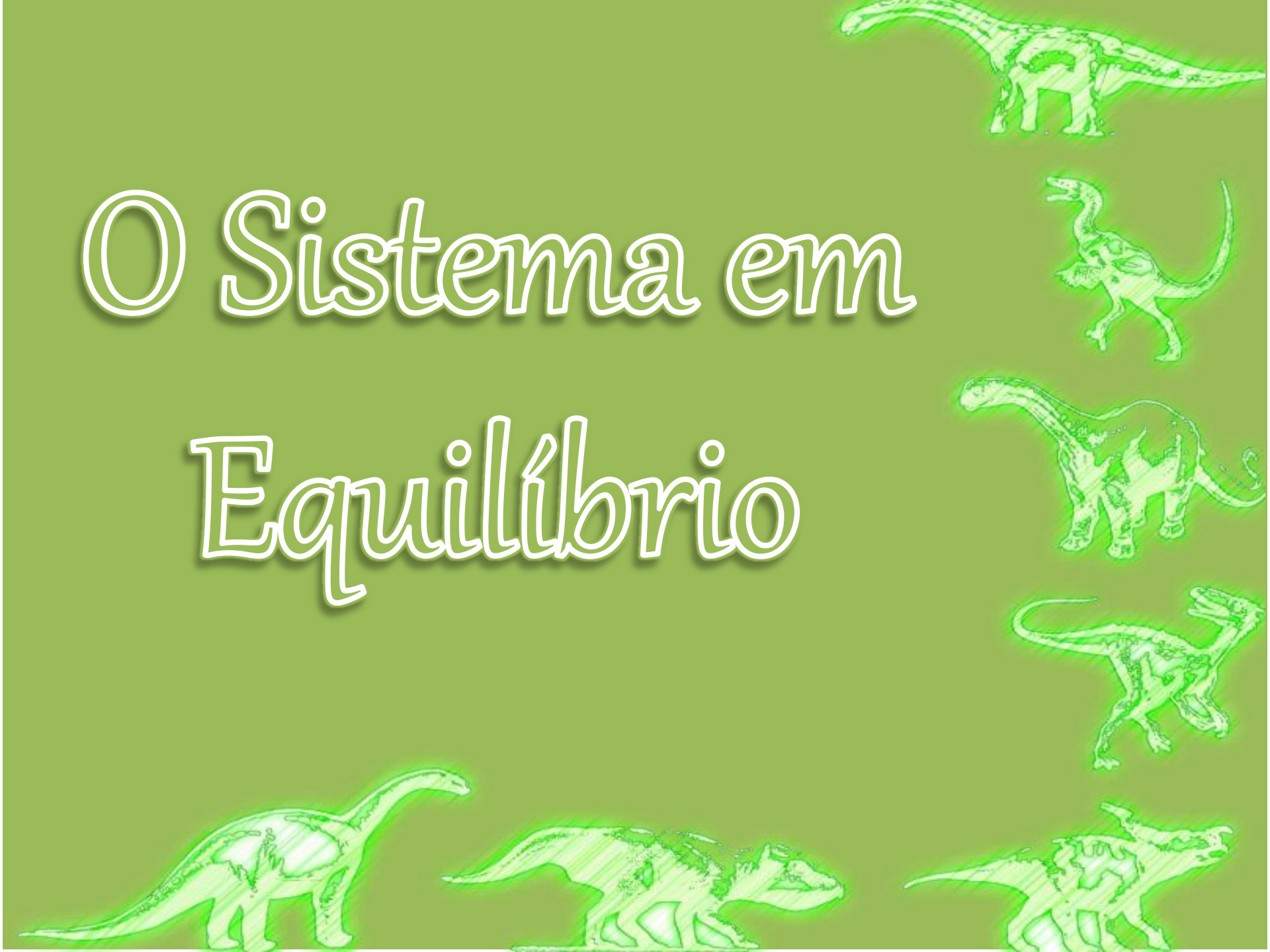
$$\Delta A = A\left(\gamma_2 \cdot S - \gamma_3 \cdot E - \gamma_4 \cdot R\right) \cdot \Delta X$$

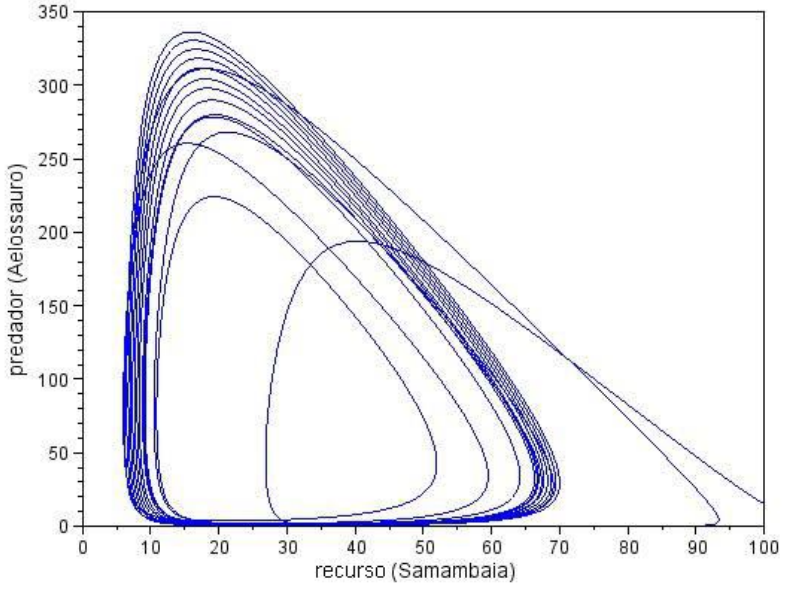
$$\Delta T = T\left(\gamma_5 \cdot S - \gamma_6 \cdot E - \gamma_7 \cdot R\right) \cdot \Delta X$$

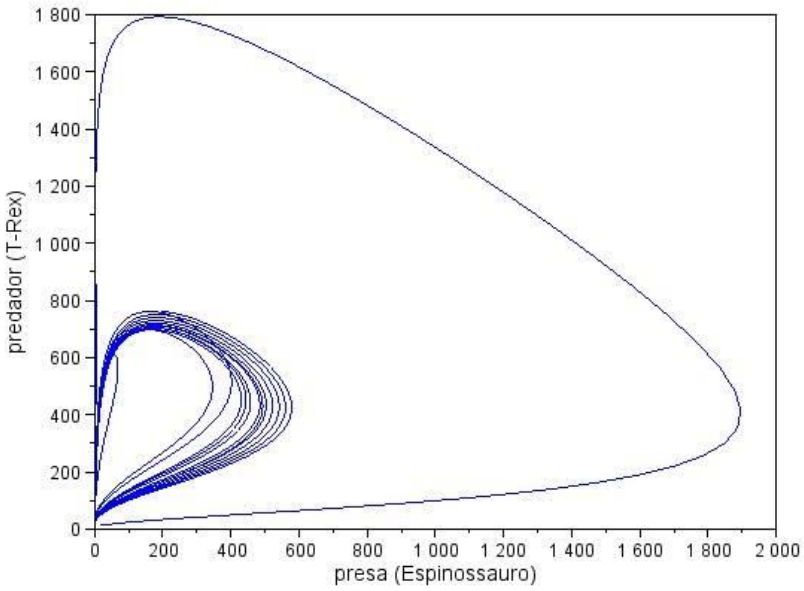
$$\Delta E = E\left(\gamma_8 \cdot A + \gamma_9 \cdot T - \gamma_{10} \cdot R\right) \cdot \Delta X$$

$$\Delta R = R\left(\gamma_{11} \cdot E + \gamma_{12} \cdot T + \gamma_{13} \cdot A - \rho\right) \cdot \Delta X$$

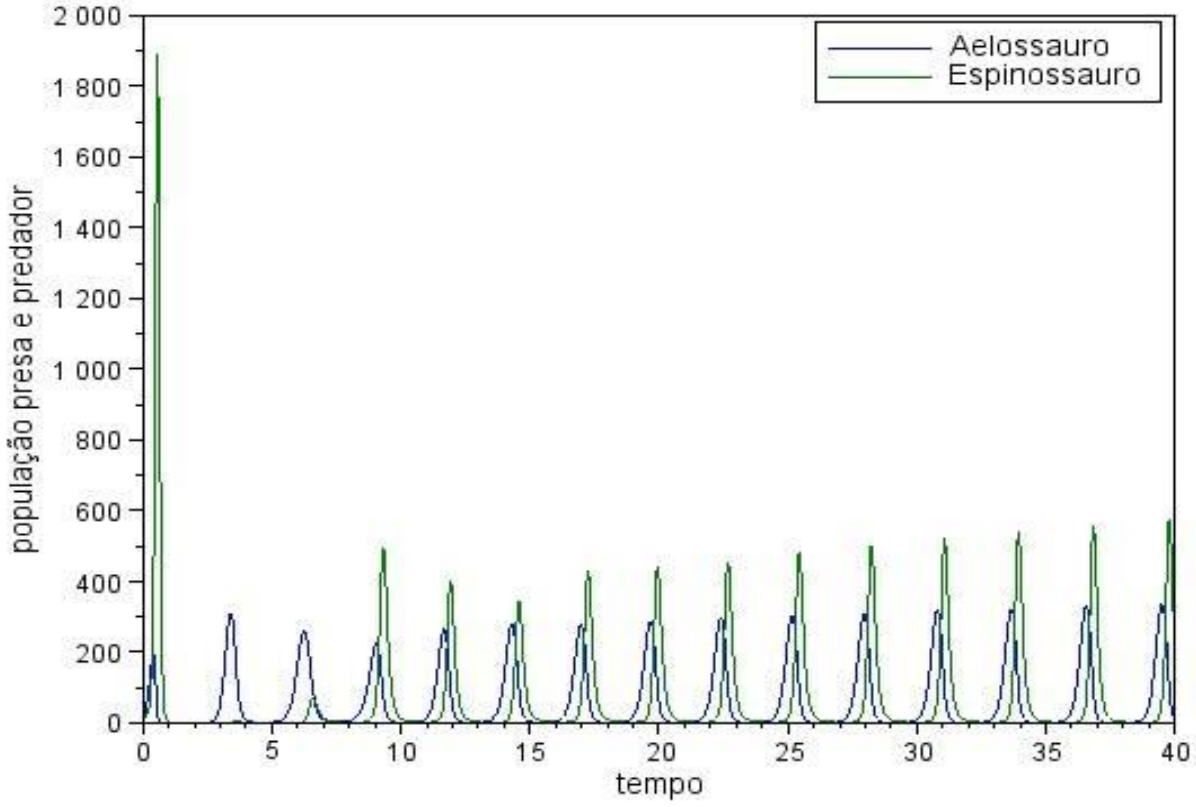
O Sistema em Equilíbrio



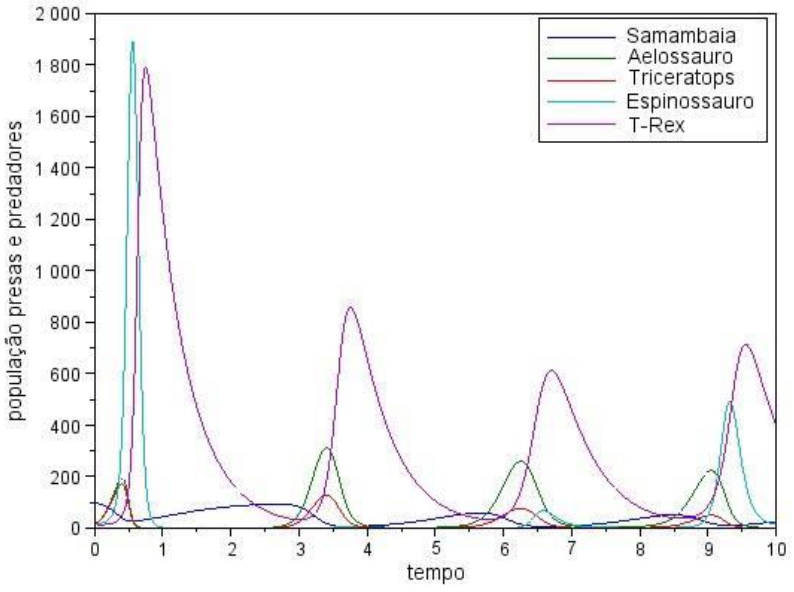

predador (Aelossauro)
recurso (Samambaia)
0
50
100
150
200
250
300
350
0
10
20
30
40
50
60
70
80
90
100

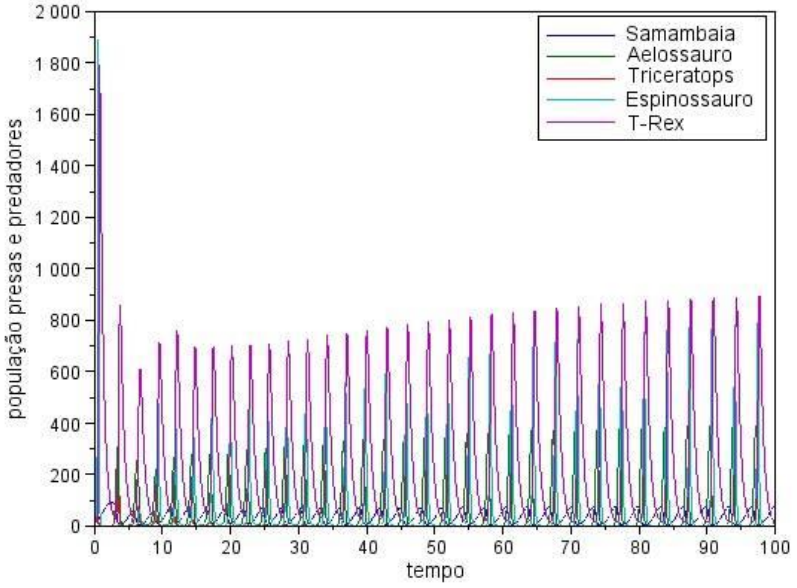

predador (T-Rex)
presa (Espinossauro)
0
200
400
600
800
1 000
1 200
1 400
1 600
1 800
2 000

Equilíbrio entre Presa-Predador



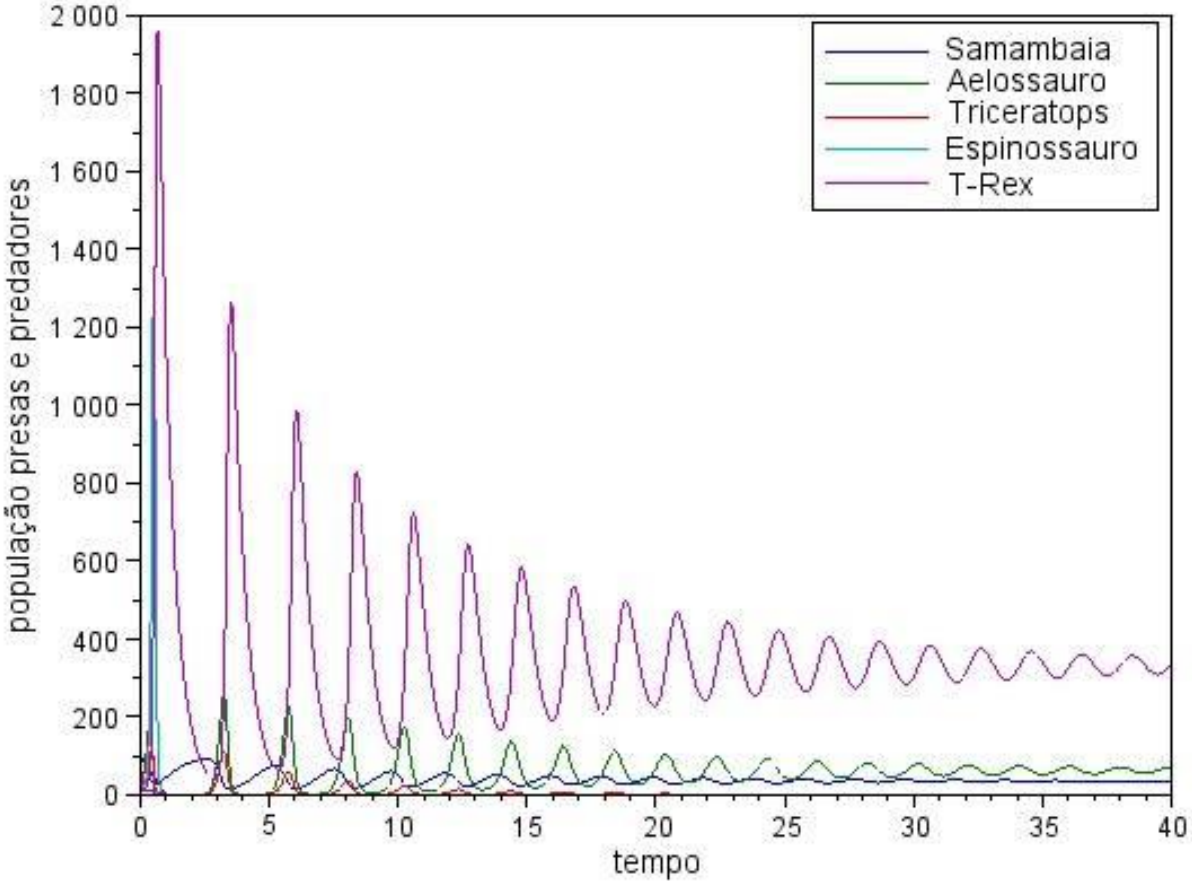
O equilíbrio



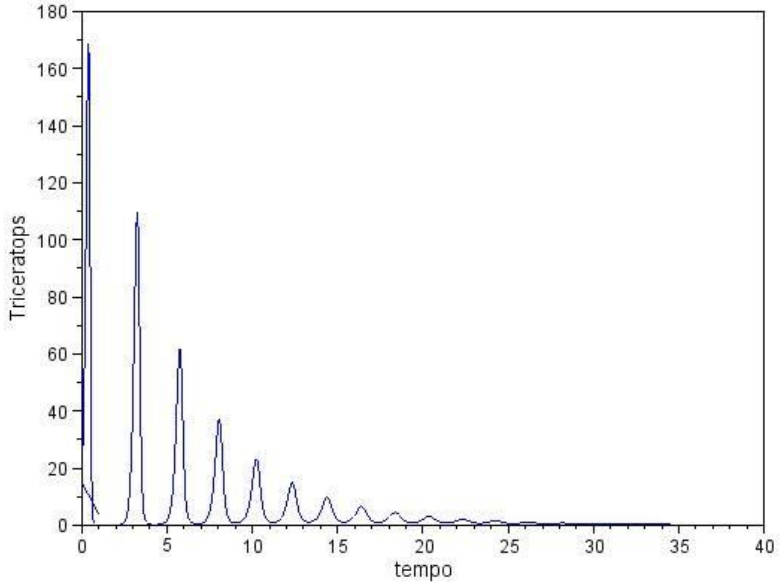


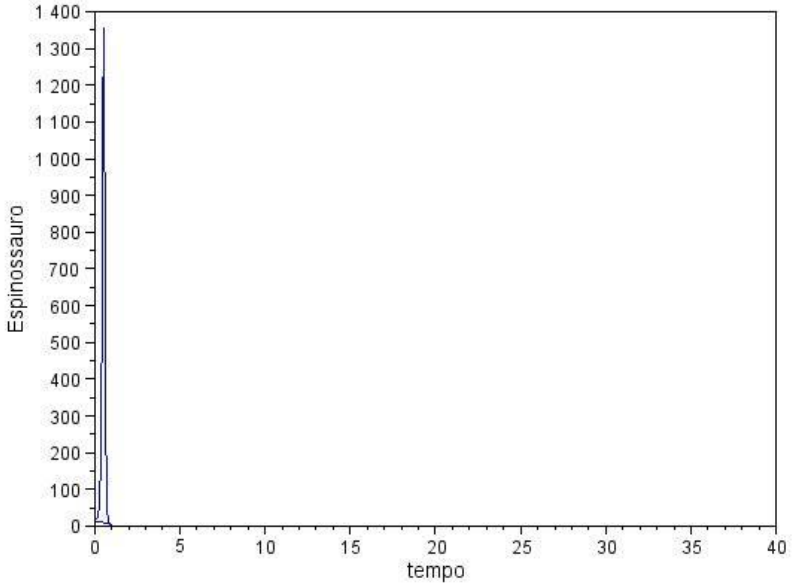
Algumas Perturbações

Alteração no sistema

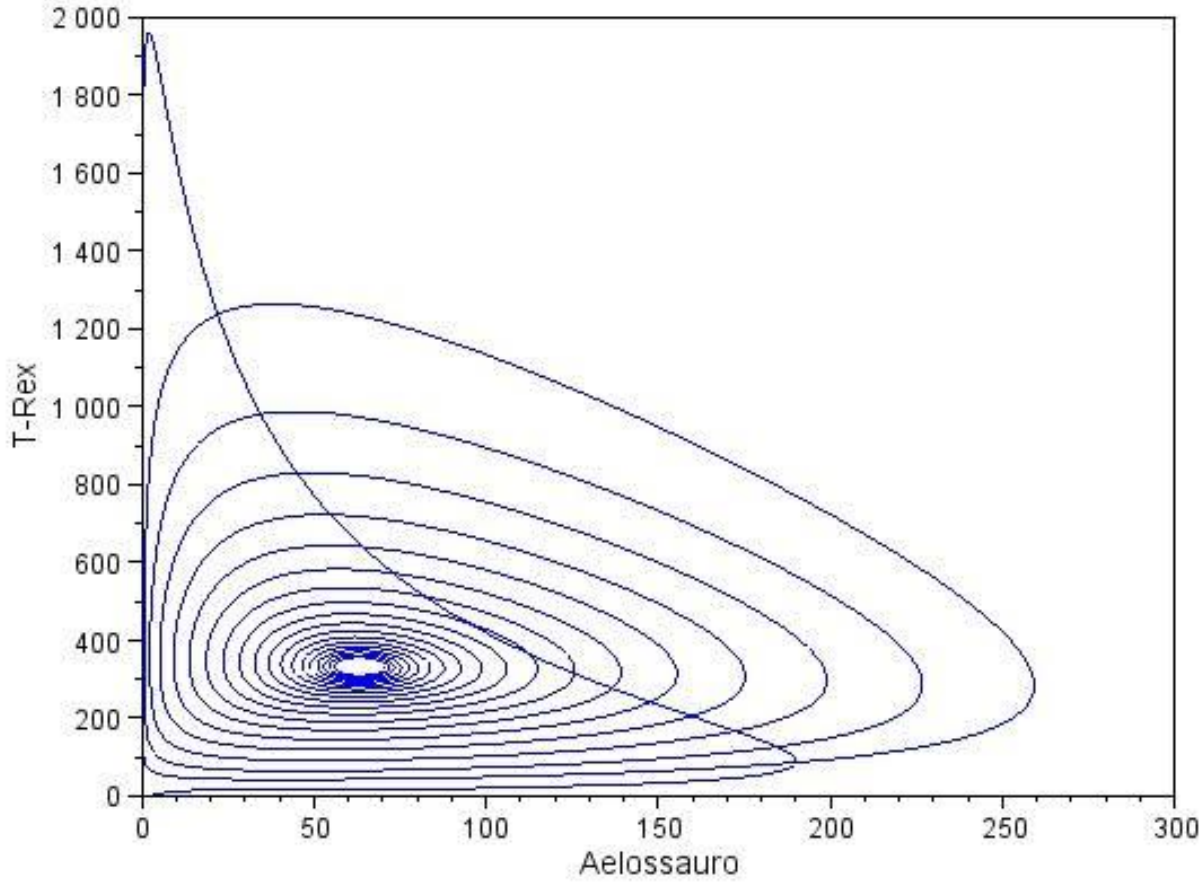


Extinção


Triceratops
tempo
0
20
40
60
80
100
120
140
160
180
0
5
10
15
20
25
30
35
40


Espinossauro
tempo
0
100
200
300
400
500
600
700
800
900
1 000
1 100
1 200
1 300
1 400
0
5
10
15
20
25
30
35
40

A volta ao equilíbrio



O total colapso