

Exploiter-Victim (not anthropomorphic)

Predator-Prey

Parasite-Host

Herbivore-Plant

$E(t)$, $V(t)$: Population Sizes

Increase $E(t)$, dV/dt Declines

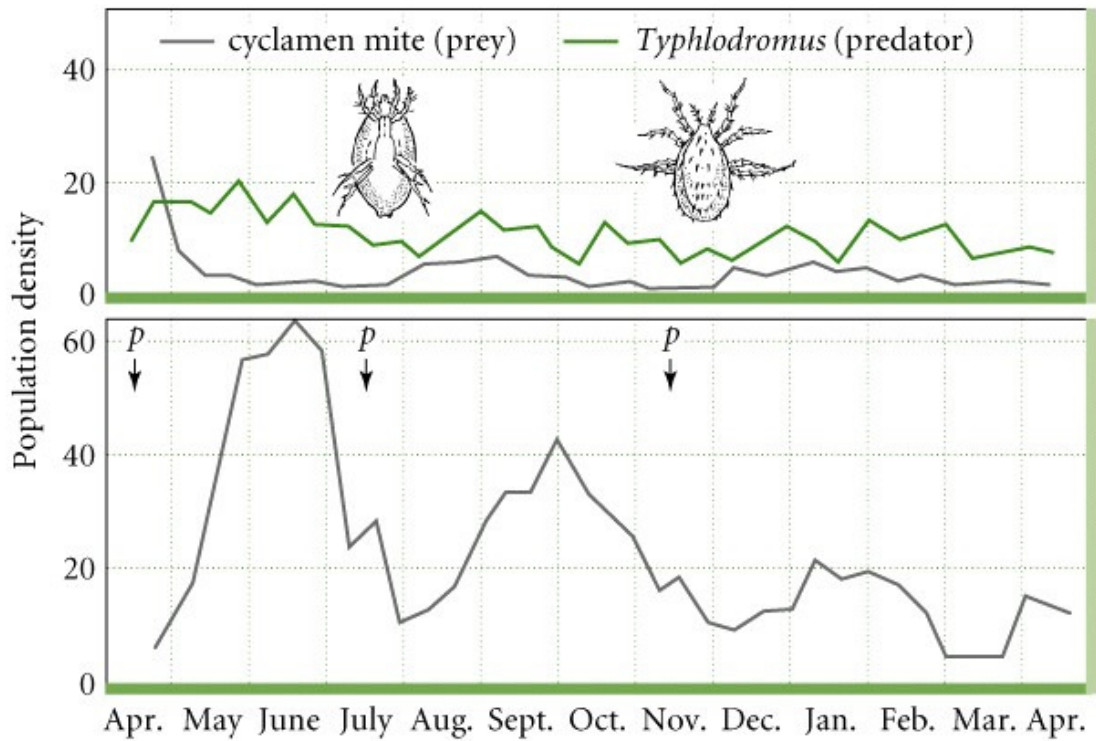
Increase $V(t)$: dE/dt Increases

Predation important?

Regulate Prey density?

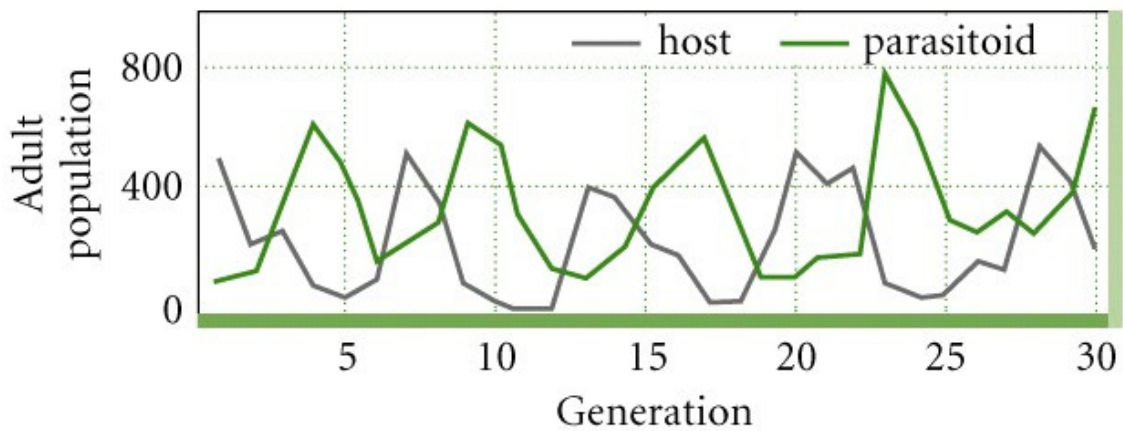
(Figures from Ricklefs & Miller, 2001)

Regulation of prey by Predator



Predator controls prey more effectively than biocide application.

Note Predator-Prey Cycles in Nature



Lotka-Volterra Predator-Prey Model

1. Prey regulated by predation only (no self-regulation)

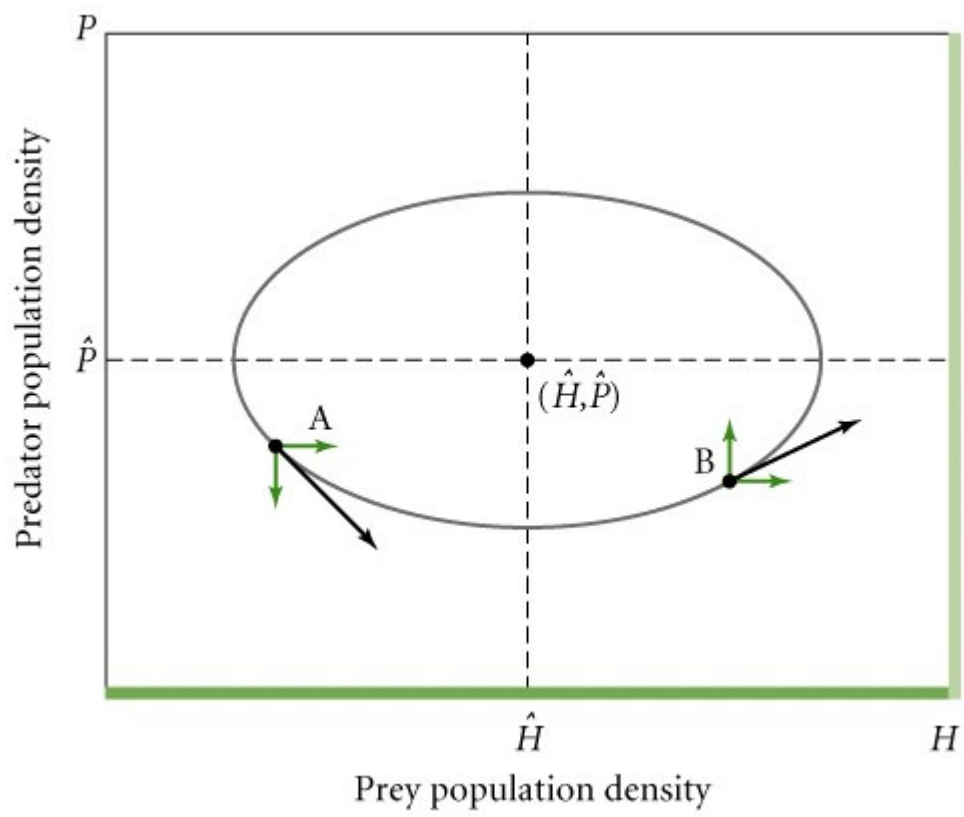
Prey grow if predator below critical density

Prey decline if predator above critical density

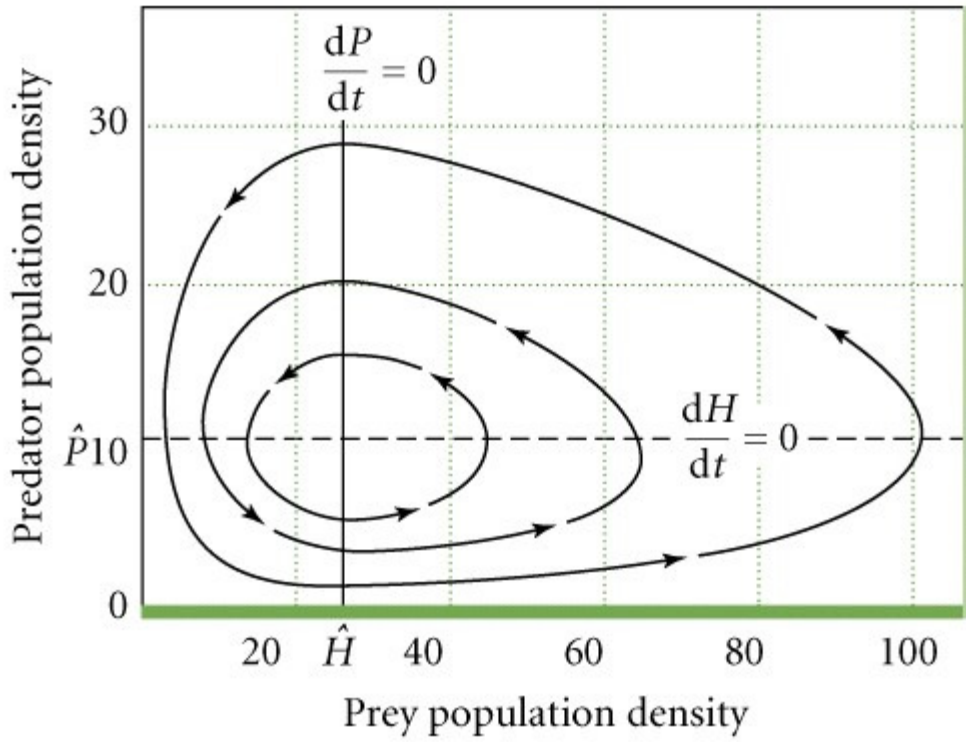
2. Predator regulated by prey only

Predator grows if prey above critical density

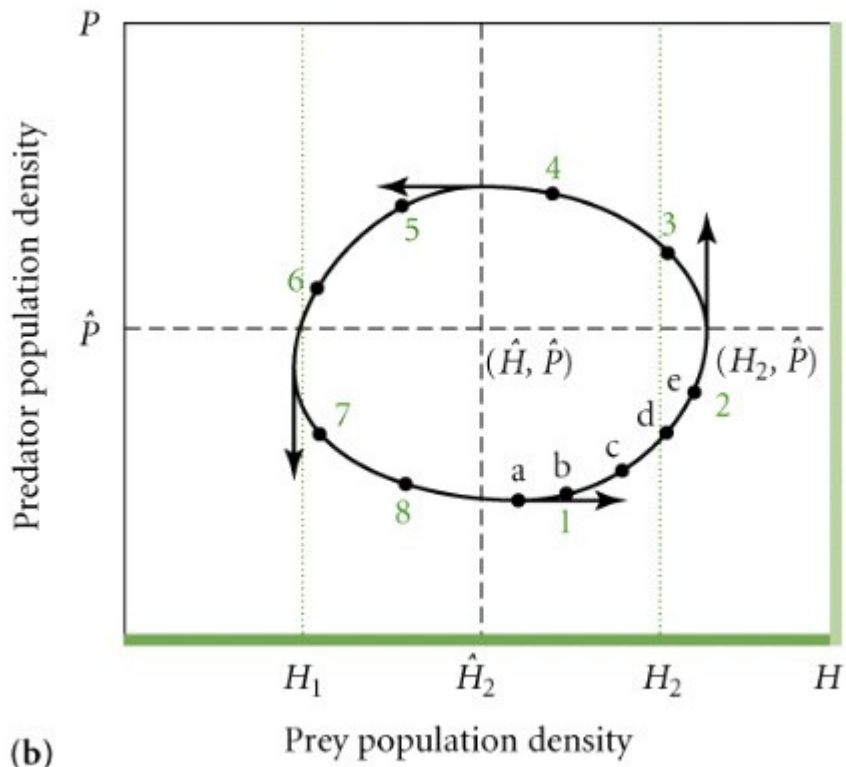
Predator declines if prey below critical density



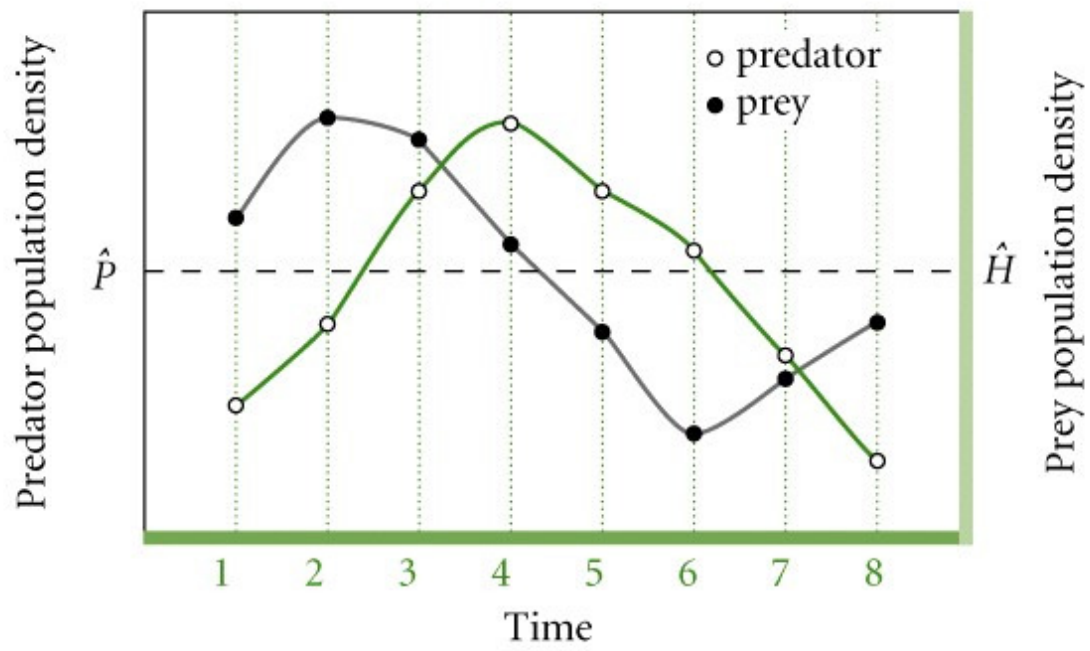
Neutral stability



(a)



(b)



(c)