Predator Prey Cycles in The Lab. 22.9

- meet assumptions of models.

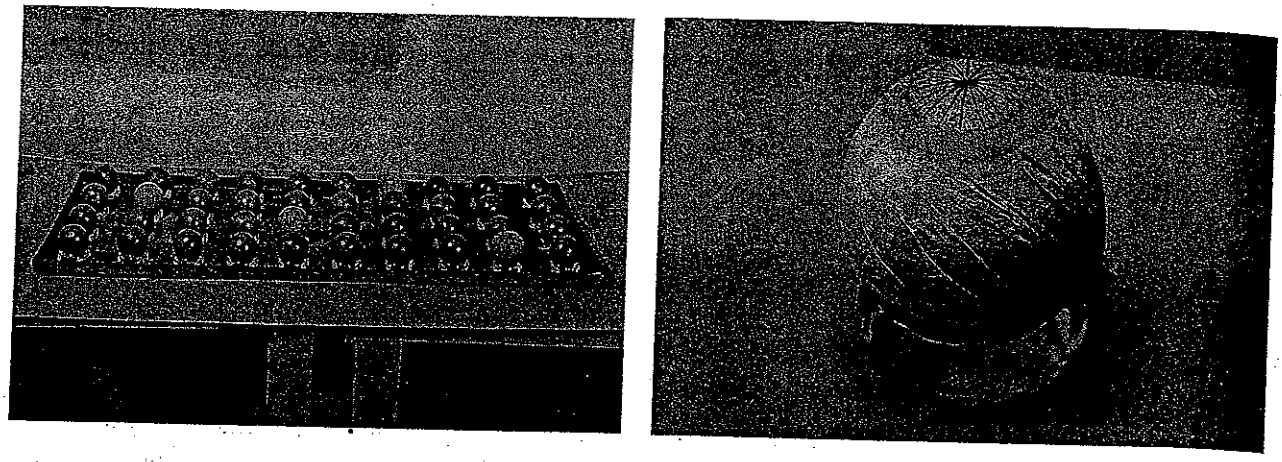


Figure 21–5
One of Huffaker's experimental trays with 4 oranges, half exposed, distributed at random among the 40 positions in the tray. Other positions are occupied by rubber balls. Each orange was wrapped with paper and its edges sealed with wax. The exposed area was divided into numbered sections to facilitate counting the mites. (From Huffaker 1958; courtesy of C. B. Huffaker.)

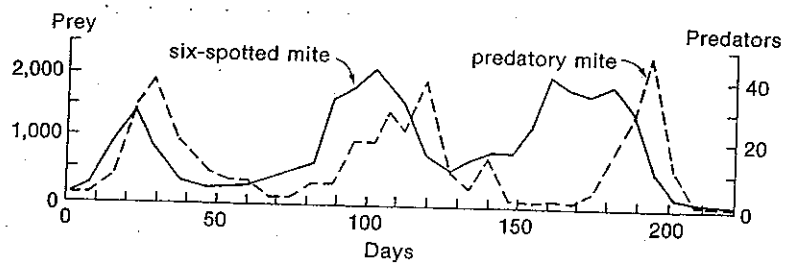


Figure 21–6
Below: Population cycles of the six-spotted mite and the predatory mite *Typhlodromus* in a laboratory situation. *Above:* The boxes show the relative density and positions of the mites in the trays: shading indicates the relative density of six-spotted mites; circles indicate the presence of predatory mites. (After Huffaker 1958.)

Huffaker's orange mites

(note - tended to be unstable, with extinctions, unless distance or barriers created prey refuges)

Predation - induced cycles in lab.

22.10

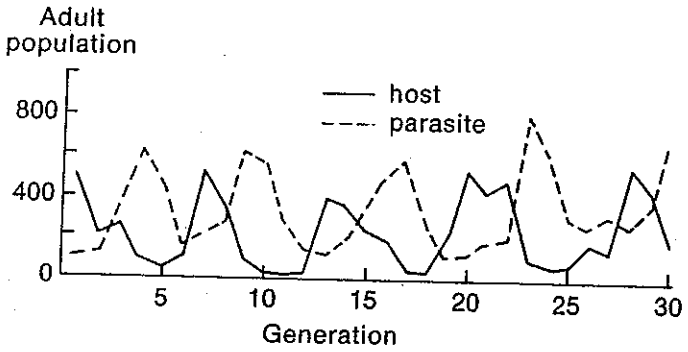


Figure 21–4
Population fluctuations of the azuki bean weevil (host) and its braconid wasp parasitoid, *Heterospilus*. (After Utida 1957.)

A cycle in the wild (?) Later events wolf ↓ to 6 + stay low

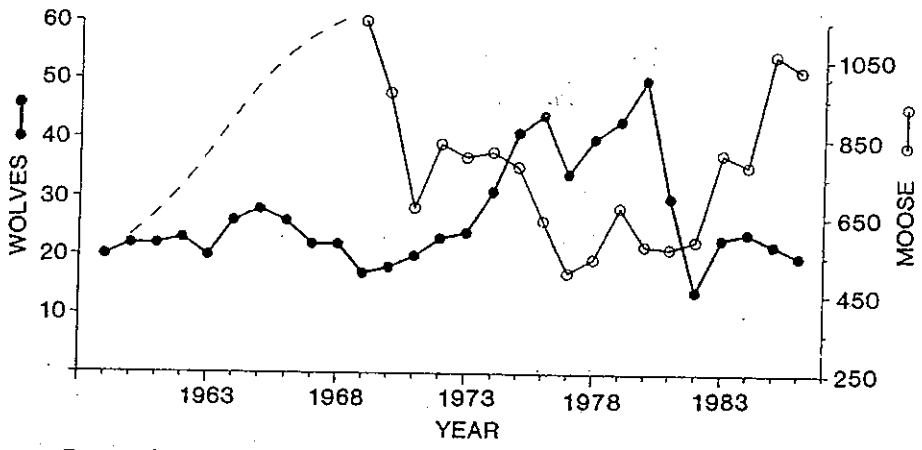
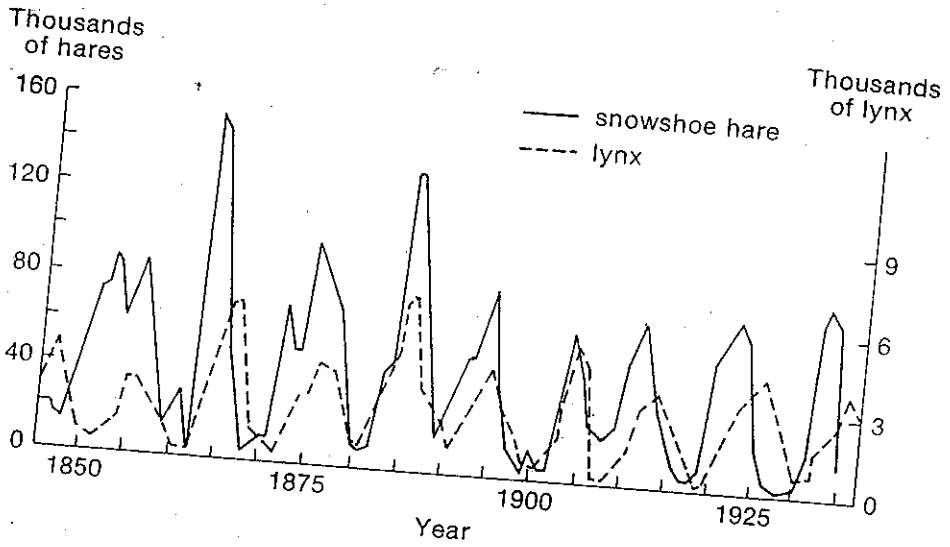


FIG. 1.—Fluctuations of wolves and moose numbers in Isle Royale National Park, 1959–86.

Hare - Lynx
- grand daddy of all cycles. 1000's of square miles synchronous.
- has run many cycles (stable cycles over time + space)

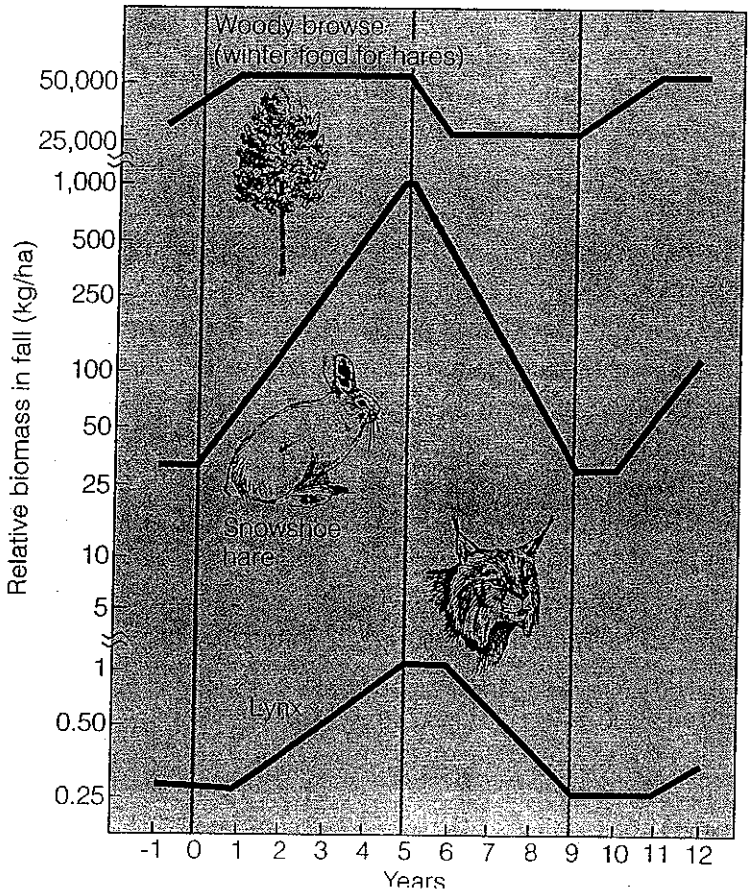


But is this a cycle induced by one-predator / one-prey dynamics, as in L-V model?

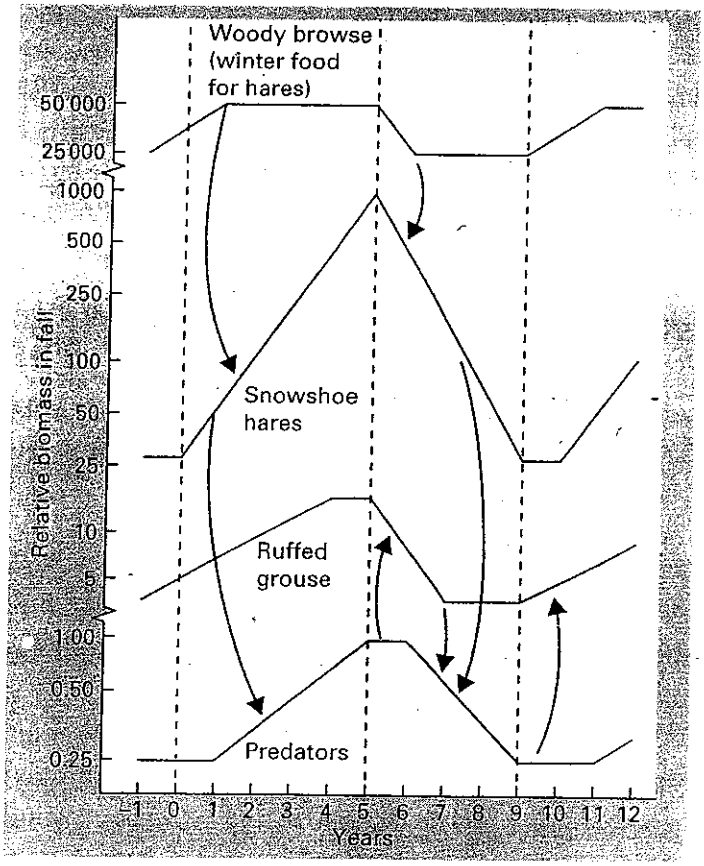
22.12

NO.

Details of cycle are better explained by adding consideration of:



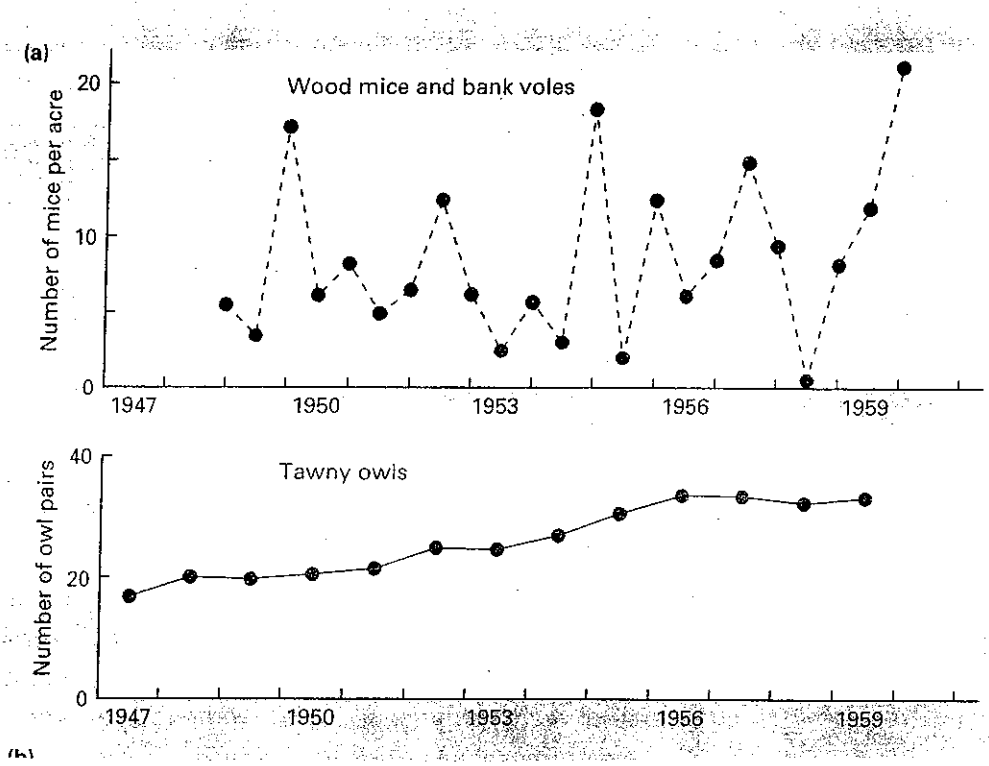
(1) Woody Food for HARES in winter (crunch period) - much of cycle due to low reproduction rather than survival.



(2) Cyclic changes in another impt. prey species

Figure 10.5 Fluctuations in the relative biomass of the major components of 'wildlife's 10-year cycle' in Alberta, Canada. The arrows indicate the major causative influences. (After Keith, 1983.)

Generalist Predator: when given prey spp ↓, switch to other prey.



Decouples the dynamics of predator and prey numbers.

∴ cycles most likely in ⓐ 1 pred / 1 prey systems, ⓑ where other forces (e.g. food competition) are weak.