Previous lecture.

Simulation experiment.

Lotka-Volterra comp. model with infrequent mutations.

Population dynamics: (short-term)

Strategy dynamics: (long-term)

\[ 0 < x < 1 \] (long-range comp.)

\[ 1 < x \] (short-range comp.)
Important note:

The (short-term) population dynamics were fully specified, but the (long-term) evolutionary pattern is emergent.

Question:

Could we predict the evolutionary pattern from the population dynamics?

That is what adaptive dynamics is about.

The four basic assumptions of adaptive dynamics:

1. Clonal reproduction.
2. Resident pop. is at a pop. attractor by the time the next mutant comes along.
3. Initial mutant population density is very small compared to the resident pop. density.
4. Small mutation steps.

These assumptions set adaptive dynamics apart from alternative approaches, and make it especially suitable for studying the evolution of complex ecological interactions.