

Compatible with NetLogo 6.0.2

WHAT IS IT?

This model simulates the behavior of evolved primate agents to test hypotheses in behavioral ecology. Users input genotype files to seed the initial population and run simulations to evolve these populations, and their genotype files, over generation. Strategies that are most beneficial for a given environmental context are expected to emerge.

HOW IT WORKS

Primate agents possess two chromosomes that dictate the weighted behavioral preference for given environmental conditions. These weighted preferences can mutate and so new behavioral strategies can emerge over generations.

HOW TO USE IT

SETUP: returns the model to the starting state

GO: runs the simulation

GO ONCE: runs exactly one tick, or time step, of the simulation

INITIAL-NUMBER-OF-GROUPS: The number of groups present at the start of a simulation

INITIAL-GROUP-SIZE: The initial number of individuals (half male, half female) in each group

PATCH-COUNT: The number of distinct food patches in the world.

PATCH-RADIUS: The radius of the patch, in cells.

PATCH-GROWTH-RATE: The rate at which food in patches regrows after being eaten.

PATCH-MAX-ENERGY: The maximum energy per patch.

FOOD-EATEN-PER-STEP: Amount of energy eaten by a primate per time step.

COST-PER-BMR: The energy cost for basal metabolic rate, calculated from body size.

COST-PER-UNIT-STEP: The energy cost for moving one step.

COST-PER-GROWTH-UNIT: The energy cost for growing body size.

COST-PER-ATTACK: The energy cost incurred when an individual is attacked.

PREDATOR-SIZE: The size of the predator, which correlates with how much energy they will take from their victims.

INITIAL-PREDATOR-COUNT: Initial number of predators in the simulation.

ALARM-CALLS?: Set to ON if you want to allow primates to make alarm calls at predators.

THINGS TO NOTICE

The individuals in the initial seeded population have the same genotype(s). However, stochastic occurrences and fluxuating environmental conditions (based on the social structure of the

population) cause unique individual behaviors to emerge in an unexpected and idiosyncratic way. Over time, as the number of accumulated mutations increases, more individuals may appear to have unique behavioral strategies and life histories.

THINGS TO TRY

You can modify genotype files to many different configurations. Explore how INITIAL-NUMBER-OF-GROUPS and FEMALES-PER-GROUP settings may influence behavioral strategies. However, genotype configuration also influence female, and male, strategies.

HOW TO CITE

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