Population extinction risks of three Neotropical small mammal species

Mauricio Lima, Pablo A. Marquet, Fabian M. Jaksic

Abstract

The population persistence and extinction probabilities of three small mammal species were analyzed by estimating growth and extinction properties obtained from 10 years of live-trapping data at two different habitat types in semiarid Chile. We used a stochastic formulation with an exponential growth model known as a Wiener-drift process, out of which growth and extinction quantities were estimated. The rodent *Phyllotis darwini* showed the lowest rates of growth, and the lowest infinitesimal variances, whereas the opposite trend was found for the rodent *Akodonolivaceus*. The marsupial *Thylamys elegans* showed intermediate values for growth rates and infinitesimal variances. The rodent *P*. *darwini* showed the lowest extinction risk in the study site. We also detected spatial differences between mesic and xeric habitats in the growth rates of *P*. *darwini* and *T*. *elegans*, and in the extinction risks of the three species studied. Although the population growth of these three species can be approximated by purely stochastic processes, the introduction of density dependence through autoregressive log-linear models reduced the extinction times of all species analyzed.