

1145-92-1176

**Sebastian Schreiber\*** ([sschreiber@ucdavis.edu](mailto:sschreiber@ucdavis.edu)), Department of Evolution and Ecology, University of California, Davis, CA 95616. *Genetic diversity as a rescue mechanism in stochastic environments.*

Environmental stochasticity corresponds to fluctuations in environmental conditions resulting in fluctuations in the fitness of individuals. As these fluctuations reduce the geometric mean of fitness, environmental stochasticity can result in populations going extinct. In this talk, I illustrate how genetic diversity within populations can rescue populations from this extinction. Specifically, I introduce a system of stochastic difference equations representing the dynamics of a diploid population with  $k$  alleles at a single locus. An analysis of these equations yields conditions for when (i) all alleles stochastically coexist (i.e. exhibit a statistical tendency for the allelic frequencies to remain away from zero) and (ii) the population stochastically persists or goes asymptotically extinct for all initial conditions. In the special case of alleles with identically distributed additive contributions to fitness, (i) and (ii) characterized in terms of the number of alleles and the mean, variance, and covariance of their additive contributions to fitness. This characterization reveals when there is a critical number of alleles required for population persistence (i.e. rescue via genetic diversity). (Received September 19, 2018)