Pace and parity predict short-term persistence of small plant populations.

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Abstract

Life history traits are used to predict asymptotic extinction risk from dynamic conditions. Less is known about how life history traits interact with stochasticity and population structure of finite populations to predict near-term extinction risk. Through empirically parameterized matrix population models, we study the impact of life history (reproduction, pace), stochasticity (environmental, demographic), and population history (existing, novel) on the near-term population dynamics of finite populations of plant species. Among fast and slow pace and either uniform or increasing reproductive intensity or short or long reproductive stage duration, slow, semelparous species are at the greatest risk of extinction. Long reproductive stages buffer existing populations from extinction while extinction risk of novel populations decrease when reproductive effort is uniformly spread across the reproductive stage. Our study highlights the importance of population structure, pace, and two distinct aspects of parity for predicting near-term extinction risk.

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