Asymptotic behaviour of random tridiagonal Markov chains in biological applications

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Discrete-time discrete-state random Markov chains with a tridiagonal generator are shown to have a random attractor consisting of singleton subsets, essentially a random path, in the simplex of probability vectors. The proof uses the Hilbert projection metric and the fact that the linear cocycle generated by the Markov chain is a uniformly contractive mapping of the positive cone into itself. The proof does not involve probabilistic properties of the sample path and is thus equally valid in the nonautonomous deterministic context of Markov chains with, say, periodically varying transitions probabilities, in which case the attractor is a periodic path.