

Invasion speeds in a competition-diffusion model with mutation

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We consider a reaction-diffusion system modelling the growth, dispersal and mutation of two phenotypes. This model was proposed by Elliott and Cornell (2012), who found evidence that for a class of dispersal and growth coefficients, the two phenotypes spread into the unstable extinction state at a single speed that is faster than either phenotype would spread in the absence of mutation. Under suitable smallness conditions on the effect of mutation and inter-morph competition, we prove that the spreading speed of the two phenotypes is determined by the linearisation about the extinction state, and then deduce both that the spreading speed is a non-increasing function of mutation, and the ratio at which the phenotypes occur at the leading edge in the small-mutation limit. This is joint work with Luca Börger and Aled Morris.