The time to fixation of a strongly beneficial mutant in a structured population

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We discuss a system that describes the evolution of the vector of relative frequencies of a beneficial allele in d colonies, starting in (0,...,0) and ending in (1,...,1). Its diffusion part consists of Wright-Fisher noises in all the components that model the random reproduction, its drift part consists of a linear interaction term coming from the gene flow between the colonies, together with a logistic growth term due to the selective advantage of the allele, and a term which makes the entrance from (0,...,0) possible. It turns out that there are d extremal ones among the solutions of the system, each of them corresponding to one colony in which the beneficial mutant originally appears. We then focus on the fixation time in the limit of a large selection coefficient, and explain how its asymptotic distribution can be analysed in terms of the so called ancestral selection graph. All this will be embedded in a short review of some classics in mathematical population genetics.