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Maladaptation of a sexual population to a changing environment

The adaptation of a population to a changing environment can be modeled by a birth and death process. Two natural questions can be studied: the existence and the concentration in the phenotype variable of the stationary states. Sexual reproduction can be modeled using Fisher's infinitesimal operator, which is not linear nor monotone. Thus, the existence of principal eigenvalues cannot be treated using the classical Krein-Rutman theory and another method has to be developed. The methodology of the WKB expansion can be adapted to this context to quantify maladaptation in a specific regime. A non linear effect appears when aging is taken into account.