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Evolutionary responses to migration load: A tall fence or a melting pot?

Gene flow between populations in different ecological conditions can reduce fitness in both populations. This can be due to immigration of alleles that are not adapted to local ecological condition or because hybrids between populations have lower fitness. But this reduction in fitness, or genetic load, is also a potential engine to drive evolution: The magnitude of the genetic load sets an upper bound to the strength of selection to compensate for the cost of migration. This load can be reduced through mating preferences for high quality mates, mating preferences for local genotypes, or by changes in the genetic architecture. Preferences for local mates would lead to reinforcement of low hybrid fitness and potentially speciation. Alternatively, preferences for high quality mates or changes to the genetic architecture might allow incipient species to continue to transfer genetic information without population collapse. I will discuss the relative strength of each pathway and the implications for local adaptation and speciation.