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Quantifying Stochastic Introgression Processes with Hazard Rates

Introgression is the permanent incorporation of genes from one population into another. It has become of particular concern with the advent of genetically modified crops, since the introgression of genetically modified crop genes into their wild relatives could have adverse effects on local biodiversity. Modeling introgression can become a difficult task, compounded by stochasticity on several levels, from the offspring distributions of certain plants, to different weather patterns. This talk outlines how a branching process based approach can be used to derive a measure of risk of introgression, the hazard rate, which is the probability per generation that introgression occurs given it hasn't occurred before. Methods to calculate the hazard rate with randomness on different levels, from individual to environmental, form the basis of the talk.