

1026-92-131

**Sivan Rottenstreich\*** (sr286@georgetown.edu), Georgetown University, St Mary's Building, Department of Mathematics, Washington, DC 20057. *Dynamics of Genetic Differentiation in Structured Populations.*

$F_{st}$  is a measure of genetic differentiation in a subdivided population. A touchstone of molecular ecology states that  $F_{st} = \frac{1}{1+2Nm}$  in a population of infinite size; where  $N$  is the size of each population,  $m$  is the migration rate, and the subpopulation migration patterns obey the so called infinite island model.

Natural populations are not infinite and therefore they change over time due to stochastic effects. In this work we ask, given an initial population state, what happens to  $F_{st}$  in a finite island model over time.

We show that after a time of order  $N$  generations,  $F_{st} \approx \frac{1}{1+2Nm}$ . Further, if  $d$  is the number of subpopulations, we show that the error in this approximation is of order  $\frac{1}{\sqrt{d}}$ . We introduce several new mathematical techniques to analyze coalescent genealogies in a dynamic setting. (Received February 22, 2007)