

Causes and Evolutionary Consequences of Human Migration: Molecular Perspective

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Microevolution, Migration, Garifuna, Aleuts, Mennonites:

Introduction.

Human migration is caused or influenced by a number of historical, ecological and cultural events. The most common are: religious persecution, push-pull-phenomena, subsistence, economic factors, and environmental catastrophes. This presentation examines the causes of migration in a number of genetically and culturally diverse populations: Black Caribs of the Caribbean and Central America, Unangan (Aleut) people of the Aleutian Archipelago, and Mennonite communities of Europe, Russia, Kansas and Nebraska. The diverse evolutionary consequences of these migrations are examined.

Methods.

Field investigations on Black Carib communities of Central America and the Caribbean were conducted from 1975-84 and 2004 to present. While research on Mennonite populations of Kansas and Nebraska were initiated in 1979 and have continued to the present. From 1999 to 2016, field investigations were conducted on 11 Unangan islands. Initially standard genetic markers of the blood: blood groups, proteins, immunoglobulins and HLA were utilized to characterize the genetic structure. Uniparental DNA markers (mtDNA and NRY) were added as DNA technology was developed. Most recently, 750,000 SNPs were analyzed for 120 Aleuts and high through-put whole genomic DNA analyzed for 200 Mennonites. Population structure was analyzed using standard multivariate methodologies and computer programs.

Results.

Diverse consequences of migration resulted from unique historical events and ecological conditions:

- (1) The small group of Black Caribs forcefully transplanted from St. Vincent Island to the Bay Islands and Honduras, provide remarkable evidence of evolutionary success due to genetic adaptation and population expansion from fewer than 2,000 persons to more than 100,000 in three generations (Crawford, 1994).
- (2) The Aleuts, driven by climatic changes and subsistence strategies expanded from the Alaska Peninsula to Attu island and because of kin migration experienced a reduction in genetic variation but with considerable micro-differentiation (Crawford et al, 2010).
- (3) The Mennonites migrated out of Europe due to religious persecution underwent fission due to doctrinal differences in the Midwestern United States. These small congregations differentiated genetically from each other in a short time span (Crawford, 2000).

Conclusions.

Molecular genetic analyses clearly reveal the evolutionary consequences of migration.

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