

Using Nuclear Introns to Assess Gene Flow Between Old and New World Common Ravens



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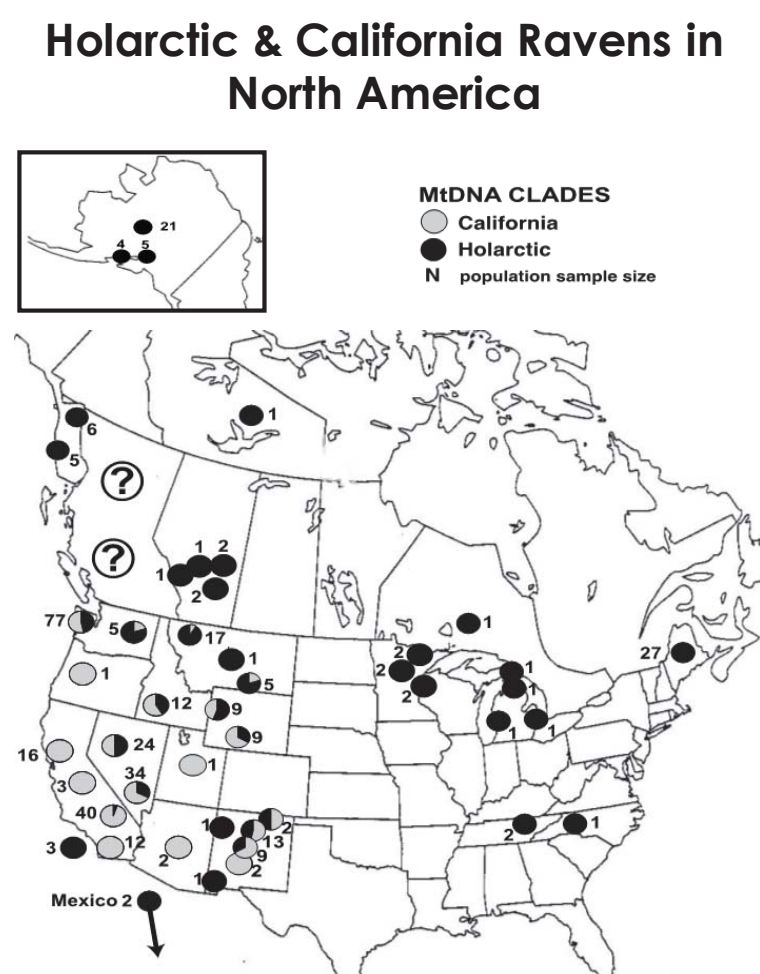
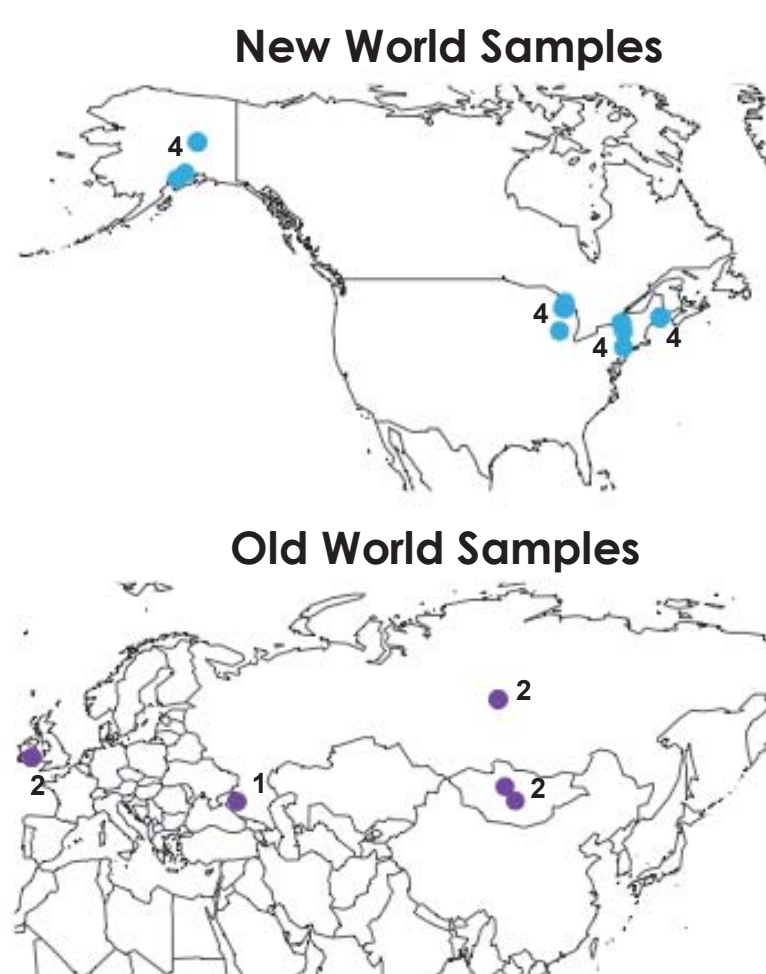


BACKGROUND

Genome sequences from our extinct close relatives have shown that modern human genomes are a mixture of three distinct lineages. To better understand the evolutionary process of interbreeding between formerly distinct lineages, we study the Common Raven (*Corvus corax*), whose range spans across North America, Europe and Asia. Within the species, there exist two distinct DNA lineages: the California clade (present only in the western United States) and the Holarctic clade (which is found throughout the entire range). Our goal is to determine whether Old World and New World ravens have diverged and whether they are exchanging genes. Ravens illustrate a dramatic case of speciation reversal, so understanding the Holarctic clade's history will help us elucidate this process. Since similar evolutionary processes occurred in both raven and human history, understanding speciation reversal in ravens could help us understand the details of human evolution.

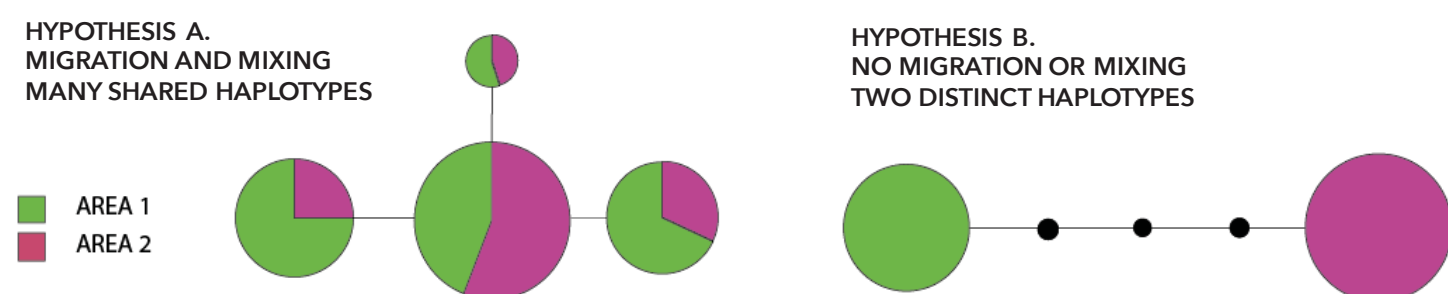


SAMPLING MAPS



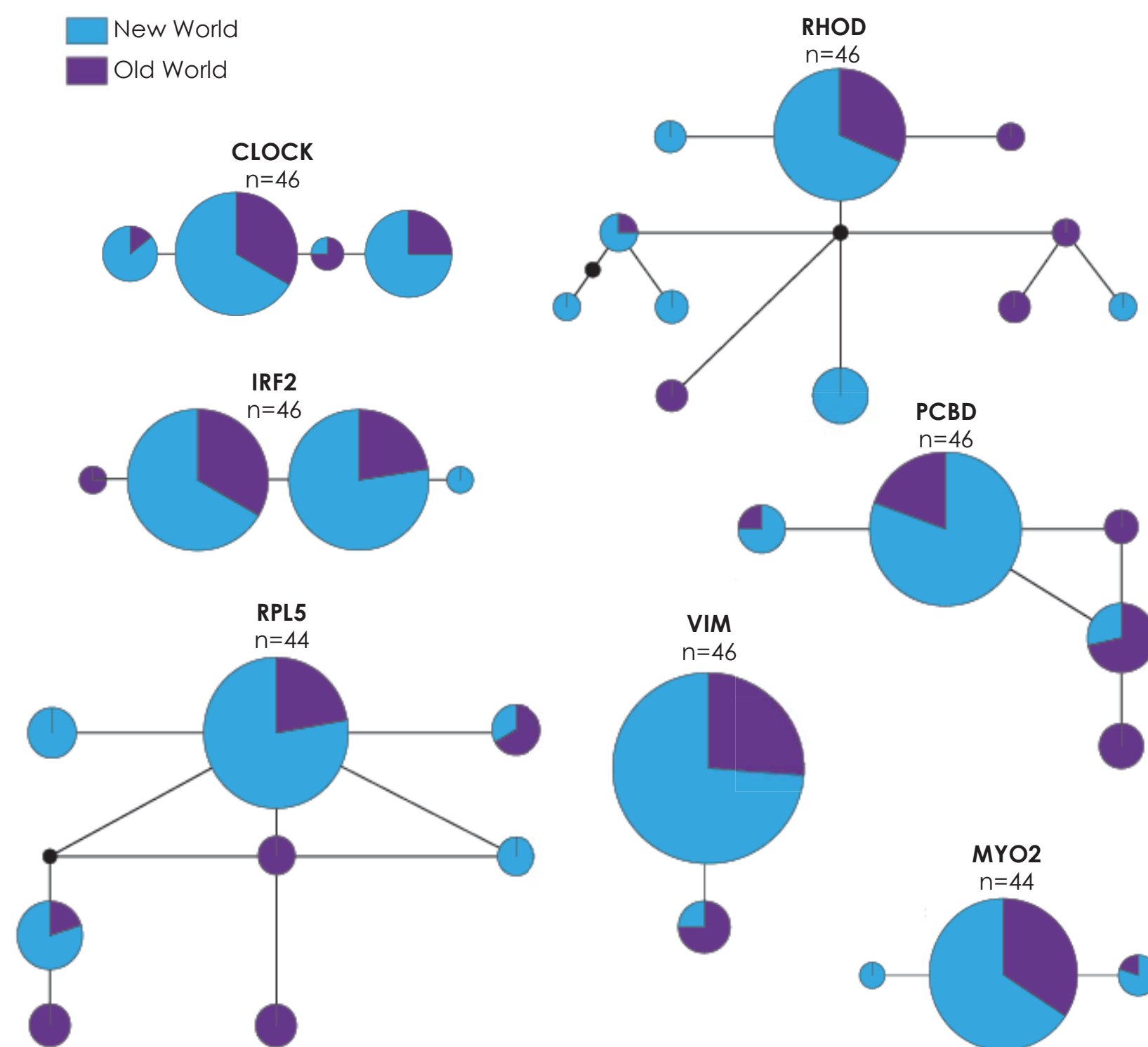
DNA SEQUENCING AND ALLELE NETWORKS:

We sequenced seven autosomal nuclear introns. We looked for single nucleotide polymorphisms (SNPs) to determine the number of haplotypes found in our data sample.



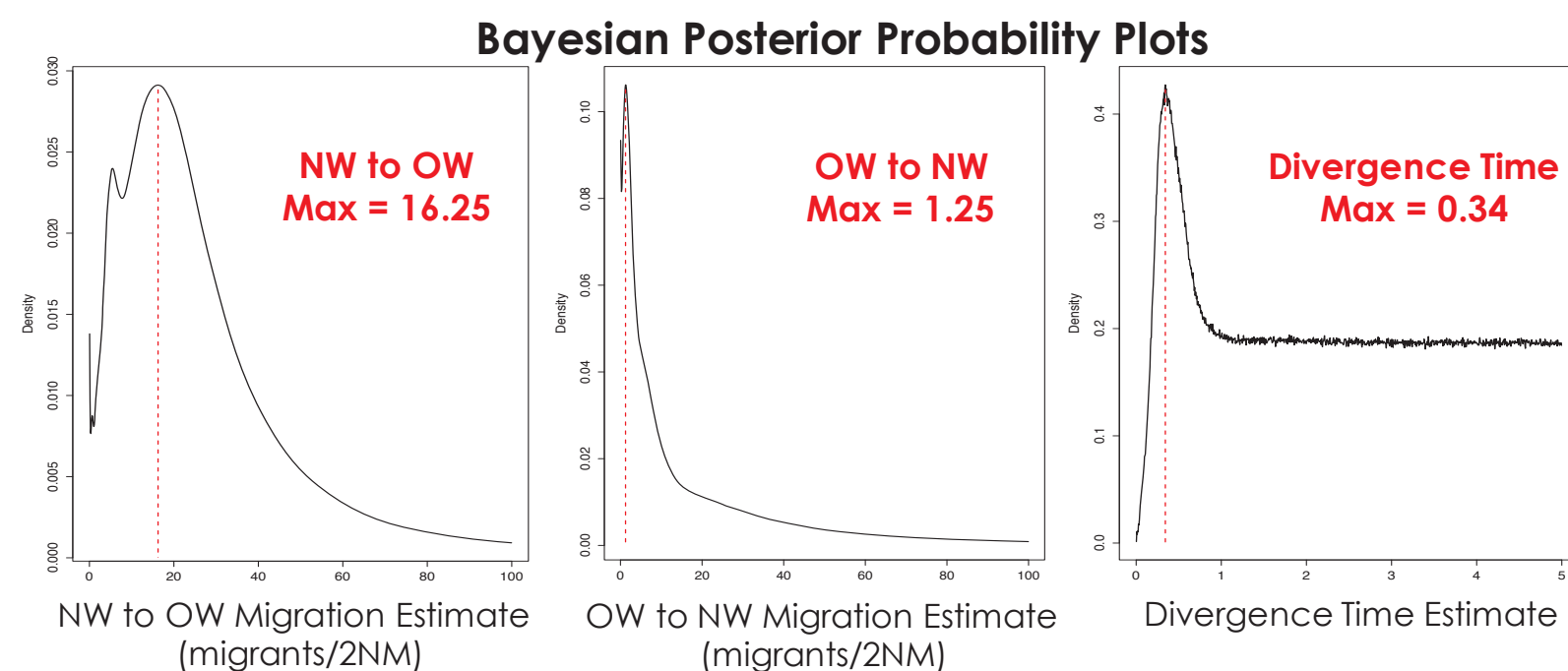
NUCLEAR DNA RESULTS

Our allele networks contain some unshared haplotypes, indicating divergence between Old World and New World Holarctic ravens. However, the presence of shared haplotypes also indicates some migration between the two populations and/or recent divergence.



IMa2 RESULTS – Estimation of Migration and Divergence Time

IMa2 is a program that tests a model accounting for only divergence against a model accounting for both divergence and migration.



CONCLUSIONS AND FUTURE STEPS

Preliminary analyses suggest a large amount of New World to Old World migration, with little Old World to New World migration. In the future, we plan to:

- Collect more data from additional Old World and New World locations
- Modify IMA2 parameters to increase run convergence and obtain better estimates

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