

Island biogeography revisited: Museomics reveals affinities of shelf island birds determined by bathymetry and paleo-rivers, not by distance to mainland

ABSTRACT

Island biogeography is one of the most powerful subdisciplines of ecology: its mathematical predictions that island size and distance to mainland determine diversity have withstood the test of time. A key question is whether these predictions follow at a population-genomic level. Using rigorous ancient-DNA protocols, we retrieved approximately 1,000 genomic markers from approximately 100 historic specimens of two Southeast Asian songbird complexes from across the Sunda Shelf archipelago collected 1893–1957. We show that the genetic affinities of populations on small shelf islands defy the predictions of geographic distance and appear governed by Earth-historic factors including the position of terrestrial barriers (paleo-rivers) and persistence of corridors (Quaternary land bridges). Our analyses suggest that classic island-biogeographic predictors may not hold well for population-genomic dynamics on the thousands of shelf islands across the globe, which are exposed to dynamic changes in land distribution during Quaternary climate change.