

Spatially explicit simulations unveil the population dynamics along the Danubian route during the Neolithic

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Abstract

The genetic diversity of modern Europeans has been greatly influenced by the transition of the way of life from hunting and gathering to farming, known as the Neolithic Transition. This change was facilitated by the arrival in Europe of Farmer populations from the Eastern Mediterranean through two main axes: along the Mediterranean coastline and along the Danube. In our study we investigate this transition specifically along the Danubian expansion axis, by using genomic data from 59 newly sequenced and 10 published ancient genomes. We use spatially explicit simulations to simulate different models of interactions between migrating Farmers and local Hunter-Gatherers and compare them with Approximate Bayesian Computations. In addition, we infer demographic characteristics of the Neolithic Transition, such as the effective population sizes of the two groups, and the levels of admixture and competition between them. Our results suggest that Long Distance Dispersal events were essential for the spread of Farmers along the Danubian route, the competition between Farmers and Hunter-Gatherers was low, at least in Central Europe, and the rate of admixture between the two groups was not constant in time. Our study sheds more light on the Neolithic Transition in Europe by describing with more details some demographic processes and characteristics of that era, helping to better understand modern European genetic diversity.