

Inferring population structure and selection from ancient DNA using bioinformatics: The Tollense Bronze Age battlefield and the Slavic cultural expansion

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Ancient DNA is like a time machine enabling to answer historical, archaeological or biological questions. With this study, we want to infer the population structure from two different historical contexts. The first is a Bronze Age battlefield from the Tollense River region in north-eastern Germany. Where did the combatants who perished there come from? The second concerns the expansion of Slavic culture that took place between the 5th and the 10th centuries AD. Was this cultural expansion accompanied by population migration or only by cultural diffusion?

To answer the first question, we analysed 19 individuals from the Tollense battlefield. Our results suggest that the combatants come from the same population clustering around Northern Europe. Because having a sufficiently large sample of one population at a given time point in history is a rare opportunity, we decided to use these data to measure the coefficient of selection of different loci of interest. We found strong and significant selection on two loci associated with lactase persistence. This shows that natural selection had a strong effect on these variants long after the Neolithic and the advent of agriculture.

To answer the second question, we analysed 11 people from either a pre-Slavic or an early Slavic cemetery, both located in Břeclav (Moravia, Czech Republic). A preliminary result shows no population structure within the sample, suggesting that Early Slavs are not so different from the population that was there before. This indicates that there was no significant migration or that the migrants were from neighbouring populations and therefore not so genetically different.

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