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Evolutionary demography of agricultural expansion in preindustrial northern Finland

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A shift from nomadic foraging to sedentary agriculture was a major turning point in human evolutionary history, increasing our population size and eventually leading to the development of modern societies. We however lack understanding of the changes in life histories that contributed to the increased population growth rate of agriculturalists, because comparable individual-based reproductive records of sympatric populations of agriculturalists and foragers are rarely found. Here, we compared key life-history traits and population growth rate using comprehensive data from the seventieth to nineteenth century Northern Finland: indigenous Sami were nomadic hunter-fishers and reindeer herders, whereas sympatric agricultural Finns relied predominantly on animal husbandry. We found that agriculture-based families had higher lifetime fecundity, faster birth spacing and lower maternal mortality. Furthermore, agricultural Finns had 6.2% higher annual population growth rate than traditional Sami, which was accounted by differences between the subsistence modes in age-specific fecundity but not in mortality. Our results provide, to our knowledge, the most detailed demonstration yet of the demographic changes and evolutionary benefits that resulted from agricultural revolution.

1. Introduction

Major shifts in human speciation and evolution are suggested to have taken