EXPLORING EARLY FARMING DIETS AND POPULATION DYNAMICS IN THE NEOLITHIC CENTRAL BALKANS

Dragana Filipović, Camille de Becdelievre, Jelena Jovanović, Thomas Büdel, Kristina Penezić, Sofija Stefanović

1 Laboratory for Bioarchaeology, Faculty of Philosophy, University of Belgrade 3 Institute for Balkan Studies, Serbian Academy of Sciences and Arts, Belgrade
2 Research Group on Plant Foods in Humanis Diet Archaeology, Max Planck Institute for Evolutionary Anthropology, Leipzig

Research background

The adoption of agriculture and sedentary lifestyle in the Neolithic may have triggered the process of Neolithic Demographic Transition (NDT) which, eventually, promoted the formation of early urban centers (e.g. Bocquen-Appel 2002; Belwood, Oxenham 2008; Drennan, Peterson 2008). The change in the food procurement system (from foraging to food production) and diet (e.g. greater intake of carbohydrates) is seen as a key factor in the increase of fertility rates leading to the remarkable population growth. Discrepancy evidence, however, such as osteological or nutritional indicators has been examined to establish the absolute link between the ‘cause’ (dietary shift) and the ‘effect’ (population growth) offered as an explanation for the NDT.

The present study aims, methods and first results

Testing the hypothesis of increased female fertility at the start of the Neolithic, and exploring the relationship between fertility rates and the introduction of ‘new foods/ agriculture are the main goals of the recently initiated project ‘Births, mothers and babies: prehistoric fertility in the Balkans between 10000-5000 BC’ (BIRTH). The project combines physical anthropological approach with the study of palaeoehntrition. It examines skeletal indicators of pregnancies, length of the reproductive period, birth-related changes in female body, neonate body proportions and survival period and health status of infants and adults. The role of diet in the population dynamics is explored through the analysis of macro- and micro-nutritional contribution of food to the overall reproductive status and health, and the potential role of plant food in weaning.

Fig. 1 Selected sites in the Danube Gorges area

The study generally focuses on the Danube Gorges area in SE Europe that yielded a large number of human skeletal remains. This region was more-or-less continuously occupied from the Final Upper Palaeolithic (c. 13000 BC) to the Early Neolithic (c. 5900-5500 BC), including the Transformational (Mesolithic - Neolithic) phase (c. 6300-5950 BC) (Boní 2011).

Fig. 2 Breastfeeding duration based on δ13C, δ15N and δS values for dentine from m1 and m1 crown and from developing teeth root and bone

Very few charred seed/fruit remains have been found at Mesolithic and Early Neolithic sites in the Danube Gorges. Thus starch preserved in dental calculus and on artefacts potentially used in food preparation/consumption is explored as another possible evidence of plant consumption. Given the detected variation in breastfeeding duration and the assumed introduction of cereal-based weaning food, dental calculus preserved on infant teeth and residue from the surface of tools possibly used in infant feeding (Fig. 4) have been examined

Initial work revealed the presence of wheat starch grains in dental calculus removed from the jaw of an Early Neolithic infant (Fig. 5a-b) and in the residue on the surface of an Early Neolithic spoon/spatula (Fig. 6a-b). The identified starch grains could have derived from ancient food. However, contamination from ancient and modern sources is highly possible and the authenticity of the starches remains to be tested.

Fig. 3 Collagen 613C and 615N values for Mesolithic and Neolithic adult humans and animals from the Danube Gorges (n=153) of which 43 unpublished, Bonsai et al. 1997; Gruse et al. 2005; Boní et al. 2006; Neelich et al. 2012; Botz Price 1983)

Further, the isotope values show diachronic and intra-regional differences in the composition of the diet. At some sites, the generally fish-based Mesolithic diet remains apparently unchanged in the Early Neolithic, whereas at others site(s) animal food of terrestrial origin seems to become dominant in the Transformational/Early Neolithic period, perhaps due to greater reliance on meat from domestic animals (Fig. 3).

Fig. 4 ‘Spoons/spatulas’ potentially used in infant feeding, as indicated by the surface wear that includes possible bite marks and drag marks made by deciduous teeth