Dietary differences between immigrants and locals in Imperial Rome

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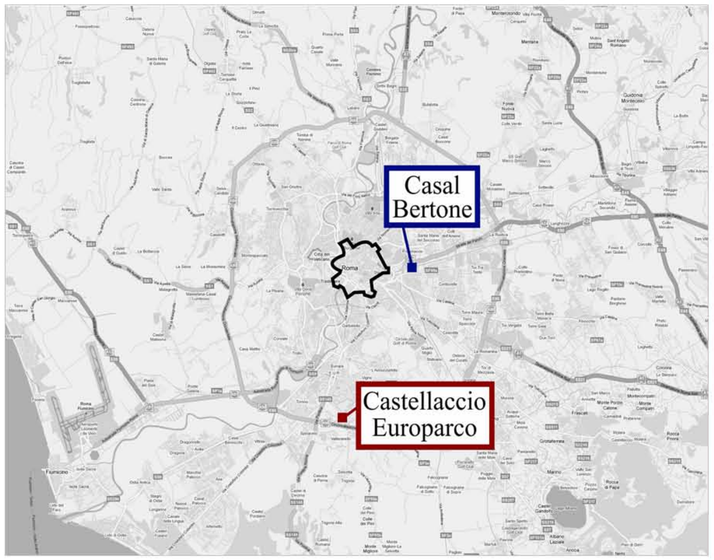
Background

Each year during the Roman Empire (c. 1st-4th centuries AD), millions of immigrants arrived at Rome, most of them slaves. The general diet of people in the city consisted primarily of grain, olives, and wine, but historical sources indicate that dietary practices varied based on age, sex, and social class (Garnsey 1999, Purcell 2003, Wilkins & Hill 2006). Recent palaeodietary studies of populations in the Roman countryside also demonstrate marked differences in diet in the Imperial period (Prowse 2001, Prowse et al. 2004, 2005, Rutgers et al. 2009). This study, however, is the first to examine the extent to which dietary differences between immigrants (both free and slave) and locals may affect our isotopic reconstruction of the Roman diet.

Figure 1. Map of Roman Sites



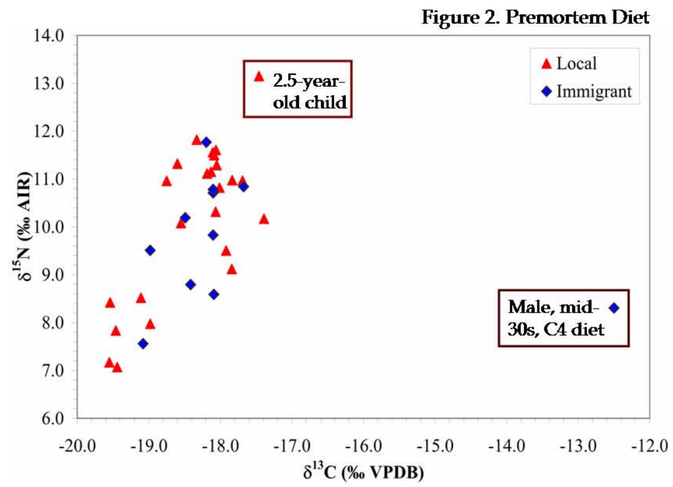
Materials and Methods

We analyzed skeletons from the Casal Bertone and Castellaccio Europarco cemeteries, both of which date to the 1st-3rd centuries AD and were located in the Roman suburbs (Fig. 1). First molars of 52 individuals had previously been subjected to strontium and oxygen isotope analysis by KK and JM, respectively, and 19 (37% of this population) were likely born somewhere other than the greater Rome area (Killgrove 2010). Enamel from each individual's first molar was analyzed for the carbon isotope ratio of the apatite portion per standard protocol by JM (Sponheimer 1999), as a proxy for childhood diet. In order to investigate premortem diet, a portion of either the midshaft femur or the rib was taken from a sample of 36 individuals whose immigrant status was known. These samples were analyzed by RT for carbon and nitrogen isotopes per standard protocols (Tykot 2004).

Results and Discussion

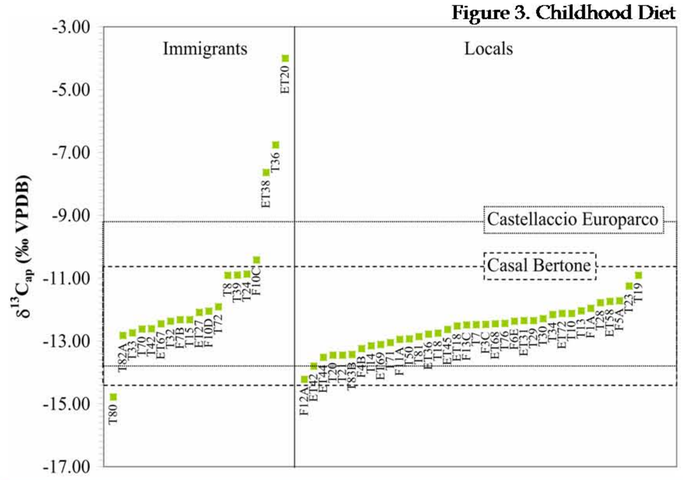
There were no statistically significant differences in a two-tailed *t*-test between the perimortem diets of locals and immigrants (Fig. 2). However, one immigrant stood out for having a startlingly high $\delta^{13}C$, likely indicating he was consuming large quantities of millet, the most abundant C_4 plant in the area, in the years before his death. A 2.5-year-old child also stands out with a high $\delta^{15}N$, likely indicating the child was still nursing or had been recently weaned.

Figure 2. Premortem Diet



When the immigrants and locals are separated and their childhood diets ($\delta^{13}C_{ap}$) are compared, significant differences are found with a two-tailed *t*-test (t=2.52, p=0.02). Further, 5 out of the 19 immigrants (26%) have values outside the dotted 2σ range of the average carbon values at each site (Fig. 3). The high carbon value of 3 of these individuals suggests consumption of a childhood diet with comparatively more C_4 plants. None of the locals had an anomalous childhood diet.

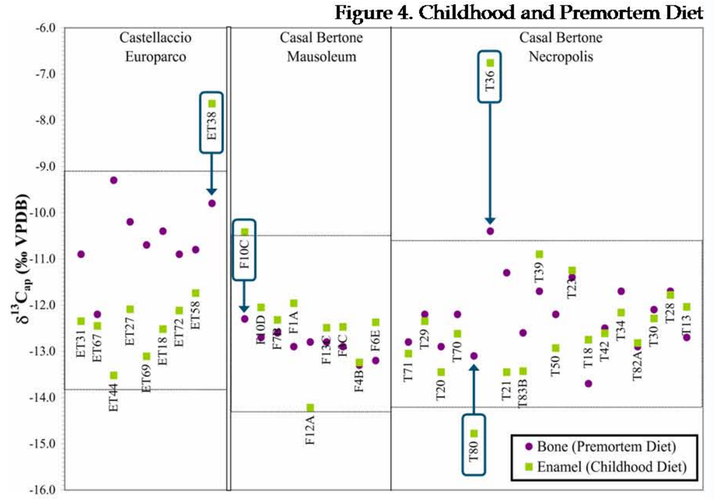
Figure 3. Childhood Diet



Combining the $\delta^{13}C_{ap}$ values obtained from the enamel and bone of the sample of 36 individuals into one graph (Fig. 4) reveals interesting differences. At Castellaccio Europarco, most people show an increase in $\delta^{13}C_{ap}$ values through time, likely indicating increased consumption of millet after childhood. Casal Bertone, on the other hand, shows less variable diets, possibly related to differences in geography or status between the two populations.

Most importantly, the immigrants whose childhood diets were strikingly different from the locals' changed their diet, presumably upon arriving at Rome. Immigrants ET38, F10C, T80, and T36 have significantly different childhood $\delta^{13}C_{ap}$ values than locals, but their perimortem values are within or close to the Roman range.

Figure 4. Childhood and Premortem Diet



Conclusions

Isotope data generated in this study indicate that all of the individuals who consumed childhood diets significantly different from the local Roman diet were immigrants. There is no conclusive evidence from perimortem diets that any immigrants to Rome retained distinct past foodways. On the whole, immigrants were most likely to adopt a local diet, whether by choice or by necessity. Nevertheless, the presence of an immigrant who died before complete bone turnover could obliterate a different isotope signature (T36) may explain some of the populational variation evident in Rome-area diets. Immigrants made up over one-third of the multicultural city of Rome during the Imperial period, and much more research is needed in order to fully understand the range of variation we are starting to see in the osteological record of Imperial Rome.

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