

# **DENTAL REDUCTION AND DIET IN THE PREHISTORIC OHIO RIVER VALLEY**

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ABSTRACT of a Master's Thesis in Human Biology at the University of Indianapolis  
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Post-Pleistocene dental reduction has been documented around the globe, although the cause of this reduction is not clear. Various mechanisms for dental reduction have been proposed and dietary change is a common factor in many of the selectionist models. Examining how changes in dental size co-occur with changes in subsistence and diet in more parts of the world help us to better understand the phenomenon of dental reduction. Therefore, the current study examines tooth size in the prehistoric Ohio River Valley of Indiana and Kentucky. The purpose of this study is to determine if a dental reduction occurred from the Late Archaic to the Mississippian periods in this region and, if so, to see if dietary shifts are associated with different rates or patterns of dental reduction.

Data from 282 individuals are compiled from 21 sites that span approximately 6,500 years, from 5000 BC to AD 1400. These sites represent the foragers of the Late Archaic period, early horticulturalists of the Early/Middle Woodland period, mixed-economy horticulturalists of the Late Woodland period, and agriculturalists of the Mississippian period. Previous studies have indicated that the diet became less abrasive through time in this region and also became harder from the Late Archaic to the Early/Middle Woodland but became much softer thereafter.

Sex was determined using standard osteological methods. Mesiodistal and buccolingual diameters were taken for all suitable permanent teeth. Occlusal area was determined using the Robustness Index correction formulae developed by Schmidt and Hill. Standard descriptive statistics were generated for each dental measurement and Analyses of Variance were conducted to determine if sex and time period significantly impacted tooth size. Percent differences and rates of change were also calculated to determine the degree of change between the various temporal groups.

It was found that a dental reduction occurred in the Ohio River Valley. Furthermore, this reduction was more pronounced in females and the maxillary molars. Post hoc tests and percent differences indicate a very marked reduction between the Late Archaic and Early/Middle Woodland periods. The rates of change, however, are often more rapid between the Early/Middle Woodland and Mississippian periods. Dental reduction seems to parallel the transition to a less abrasive and softer diet. Tooth size may have decreased significantly in the first transition as the diet became less abrasive due to more efficient food-processing techniques. Tooth size may have decreased more rapidly during the second transition with the adoption of an agricultural diet being softer and even less abrasive. Therefore, this study presents some evidence for an association between dietary abrasiveness and dental reduction.

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