

## **TOWARDS A MODEL OF A MAMMALIAN INTERFACE WITH THE PHYTOLITHS IN THEIR NATURAL ENVIRONMENT: INSIGHTS FROM TAÏ CHIMPANZEE FAECAL PHYTOLITHS**

Robert Power<sup>1,2</sup>, Roman Wittig<sup>3,4</sup>, Jeffery Stone<sup>5</sup>, Kornelius Kupczik<sup>6,7</sup>, Ellen Schulz-Kornas<sup>6,7</sup>

<sup>1</sup> *Institute for Pre-and Protohistoric Archaeology and Archaeology of the Roman Provinces, Ludwig-Maximilians-University Munich, Munich, Germany*

<sup>2</sup> *Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology,*

<sup>3</sup> *Department of Primatology, Max Planck Institute of Evolutionary Anthropology, Leipzig, Germany*

<sup>4</sup> *Taï Chimpanzee Project, centre Suisse de Recherches Scientifiques, Abidjan, Côte d'Ivoire*

<sup>5</sup> *Department of Earth and Environmental Systems, Indiana State University, Terre Haute, IN, USA*

<sup>6</sup> *Max Planck Weizmann Center for Integrative Archaeology and Anthropology, Max Planck Institute of Evolutionary Anthropology, Leipzig, Germany*

<sup>7</sup> *Department of Human Evolution, Max Planck Institute for Evolutionary Anthropology, Leipzig, Germany*

In recent years, there has been increasing use of human dental calculus as a source of phytoliths for inferring dietary data on ancient human subsistence and behaviours. The dental calculus of contemporary human and non-human populations with known diets have been used as reference data sets, including the chimpanzees of Taï National Park (Côte d'Ivoire), but explaining the preservation mechanism involved is challenged by our incomplete knowledge of the microremain content within the diets of these reference populations and our rudimentary information on the process of microremain incorporation into dental calculus. This paper presents phytolith analysis of faecal samples from a population with previously published dental calculus phytolith assemblages to assess to what extent dietary phytoliths are reflected in the dental calculus as well as in the egested faeces.

In this study, we detect and identify faecal phytolith assemblages as an indicator of plant consumption in two Western chimpanzees of the Taï National Park (Côte d'Ivoire) before (wet season), during (dry season) and after (dry season) a dust-rich period. In tandem, observational dietary records of these two individuals were compiled to improve the interpretability of this dental calculus phytolith dataset. The most common phytolith morphotypes were eudicot plates, single-cell and multi-cell tracheids, monocot rugulose and echinate spheroids. Using observational dietary records as a starting point and our faecal results as a terminus, we consider how dental calculus can accumulate phytoliths. Our findings enable identification of the phytolith morphotypes that are under-represented in dental calculus such as eudicot plates, single-cell and tracheids, which is informative for future dental calculus research strategies.

**Keywords**

dental calculus, phytolith taphnomy, assemblage bias, diet and phytoliths

**Note/comment**