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Diet, health, mobility, and funerary practices in pre-colonial West Africa: a new bio-archaeological project in the Dogon Country

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In this brief communication, we announce a new study, which aims to investigate the dynamics of what life was like during pre-colonial times for pre-Dogon and early Dogon people from the Bandiagara Escarpment in the Republic of Mali (Figure 1). This research, funded by the Swiss National Science Foundation (No. 100011_169403: 01.10.2016 – 30.09.2018), forms part of a large body of research led by the Laboratory “Archaeology and Population in Africa” (APA) at the University of Geneva, concerned with the reconstruction of settlement history and emergence of social complexity during the last two millennia (see www.ounjougou.org). Our research plans to adopt a new approach combining bio-anthropological, bio-chemical, chronological, and archaeological data to unravel the history of peopling of the Niger Bend. We will explore themes such as population relatedness, geographic origins and mobility patterns of people, dietary continuity or change, economy, diseases, and evolution of funerary practices. To do so, we employ

different methods including dental anthropology, stable isotope analyses of carbon, nitrogen, and strontium, and palaeo-microbiology. Numerous AMS radiocarbon dates will also be processed from the human skeletal remains to establish the use of the different burial caves through time, as well as to detect possible epidemic events.

This study will also test the hypothesis of a non-continuous pattern of settlement in the Dogon country as suggested by the Toloy-Tellem-Dogon chrono-cultural sequence proposed by Bedaux (1972) and others. It asks: Are the pre-Dogon communities representative of culturally distinct groups of people that succeeded and replaced one another until the arrival of the Dogon in the 16th century AD? This sequence, which has been left unchallenged for more than 40 years (Mayor *et al.* 2014) consisted of three phases: a “Toloy” occupation during the 3rd-2nd centuries BC; a “Tellem” occupation from the 11th to 15th centuries AD; and a Dogon occupation after the 15th century AD.

However, recent archaeological research has shown the existence of sites dating from the 1st millennium AD in the Dogon country, a period previously considered a cultural gap between Toloy and Tellem cultures (MacDonald 1994, Gestrich 2013, Mayor *et al.* 2005, 2014, Huysecom *et al.* 2015). During the first millennium AD, occupations are important both on the plateau (ritual, settlement and metallurgical sites) and in the Escarpment (burial sites), as well as in the Seno Plain (ritual and settlement sites). In the Escarpment, a refined chronology established using radiocarbon dating of 20 straw pieces taken from the building walls in Pégué A and Dourou-Boro, shows that an architecture made of clay coils (Figure 2) has been used for almost 1,800 years (500 BC to 1400 AD), bearing witness to an impressive local cultural evolution. Various elements lead us to believe that these were primary funerary structures and not granaries reused as graves (Mayor *et al.* 2014), as previously reported in Bedaux (1972).

Situated at the interface between the Sahel and savanna zones, and part of the UNESCO cultural and natural world heritage, the archaeology of the Bandiagara Escarpment has revealed a long sequence of about 2,500 years of pre-historical occupation. The region has witnessed the emergence of social complexity along with constant interactions with groups of people from different cultural spheres (Mayor 2011, Mayor *et al.* 2014).

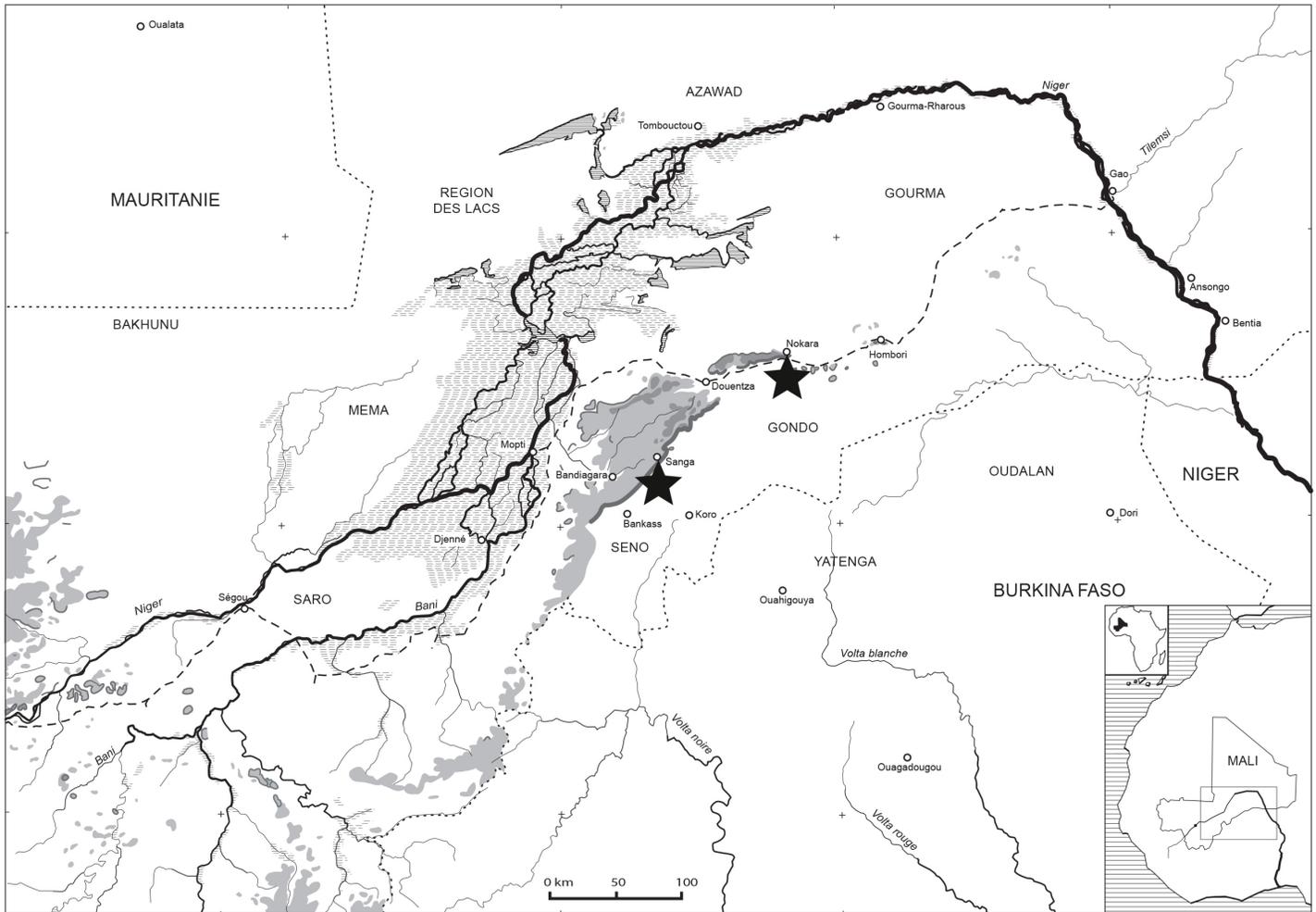


Figure 1: Geographical location of the archaeological sites - Pégué caves (also known as Sanga caves) and Nokara B (about 100km apart), indicated by black stars.

These results shed light on the Dogon country in a new way indicating that this area was a zone of constant flow and interaction of people, skills and expertise for over two millennia. They lead us, therefore, to abandon the old concepts of “Toloy” and “Tellem” in favour of the more general term of pre-Dogon people.

Studies of human skeletal remains in museum collections

Following the pioneering studies of the Dutch team in the Bandiagara Escarpment, and our research conducted since 1997, other questions concerning the mobility of pre-Dogon populations, their geographical origins and identities, as well as their life ways have developed. The interests of this multidisciplinary project lie in the pursuit to continue our research aimed at reconstructing the history of West African pre-colonial populations, and

to develop a more nuanced understanding of this history using a new methodology. Although anchored in the past, this project addresses topics relevant to today’s societies of Mali, correcting the often simplistic views of their past.

This project focuses its attention on the human remains collected during the previous projects and accessible in curating institutions. These skeletal remains are in excellent condition and show similar characteristics to fresh bone (Maurer *et al.* 2015). To date, we have collected data and samples from 220 individual crania housed at the Museum of Ethnology in Leiden, at the Institute of Human Sciences in Bamako, and at the Museum of Man in Paris. The museum collection remains come from burial cave sites in the Bandiagara Escarpment. Due to lack of stratigraphy in the caves, no associated post-cranial skeletons could be studied along the crania. The samples include 84 cranial bone pieces for AMS radiocarbon dating



Figure 2: Inside Pégué cave A showing the coiled-clay buildings.

(Figure 3), 214 dentin samples for carbon and nitrogen isotope analyses, and 165 enamel samples for strontium analyses.

We have studied the dental morphology of the pre-Dogon and early Dogon human remains from the museum collections as a means to shed light on people's origins and biological relatedness. Data from dental diseases are used to track dietary continuity or change, in combination with stable carbon and nitrogen isotopes. The stable isotopes, currently under analysis at the University of Cape Town, facilitate research on the geographic origins and movement patterns of the pre-Dogon and early Dogon people. Furthermore, the tooth enamel apatite samples obtained will be analysed for strontium isotope analysis ($^{87}\text{Sr}/^{86}\text{Sr}$) to evaluate geographic origins and migration

patterns. Finally, the bone samples are being processed in ETH Zürich for AMS ^{14}C dating.

As part of the palaeo-microbiological research, we are interested in exploring whether the bubonic plague (*Yersinia pestis*) reached the Niger Bend. The second pandemic of the bubonic plague that devastated Europe between 1346 and 1353 may have reached sub-Saharan Africa. The general abandonment of settlements around this period in numerous places of West Africa, which had been inhabited previously for centuries, seems to support this hypothesis that the bubonic plague may have reached sub-Saharan Africa or at least the Western Sahel (Chouin 2013, Huysecom *et al.* 2015, Mayor 2011). Our final research phase will be to compare analytical data with archaeological and palaeoenvironmental data



Figure 3: Crania sampled for AMS 14C dating.

collected in the framework of previous research and build a coherent picture of the dynamics of behaviours in pre-colonial West Africa.

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