

ANNUAL MEETING ISSUE 2017 SUPPLEMENT 64

American Journal of
**PHYSICAL
ANTHROPOLOGY**

The Official Journal of the American Association of Physical Anthropologists

Founded by Aleš Hrdlička, 1918



WILEY Blackwell
ISSN 0002-9483

American Journal of PHYSICAL ANTHROPOLOGY

The Official Journal of the American Association of Physical Anthropologists

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AMERICAN JOURNAL OF PHYSICAL ANTHROPOLOGY, (ISSN: 0002-9483 [Print], ISSN: 1096-8644 [Online]), is published 12 times per year, monthly by Wiley Subscription Services, Inc., a Wiley Company, 111 River St., Hoboken, NJ 07030-5774 USA. Periodical Postage Paid at Hoboken, NJ and additional offices.

Periodical Postage Paid at Hoboken, NJ and additional offices.

Postmaster: Send all address changes to AMERICAN JOURNAL OF PHYSICAL ANTHROPOLOGY, John Wiley & Sons Inc., C/O The Sheridan Press, PO Box 465, Hanover, PA 17331 USA.

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Information for subscribers: *American Journal of Physical Anthropology*, official publication of the American Association of Physical Anthropologists, is published monthly, 12 issues per year. Institutional subscription prices for 2017 are: Online: US\$4162 (US), US\$4162 (Rest of World), €2689 (Europe), £2125 (UK). Prices are exclusive of tax. Asia-Pacific GST, Canadian GST/HST and European VAT will be applied at the appropriate rates. For more information on current tax rates, please go to www.wileyonlinelibrary.com/tax-vat. The price includes online access to the current and all online back files to January 1st 2013, where available. For other pricing options, including access information and terms and conditions, please visit www.wileyonlinelibrary.com/access.

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ISSN 0002-9483 (Print)

ISSN 1096-8644 (Online)

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PROGRAM OF THE
**86TH ANNUAL MEETING OF THE
AMERICAN ASSOCIATION OF PHYSICAL
ANTHROPOLOGISTS**
APRIL 19 – 22, 2017

To be held at the

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ABSTRACTS

during a critical and vulnerable period while its own immune system develops. These molecules, particularly immune proteins, are thought to reflect the mother's lifetime immune exposures and prepare the infant's immune system to cope with challenges it will face in its local environment. The composition of milk immune proteins is known to vary within and among populations. However, what specific aspects of the environment shape this variation is not well understood. Here we investigate how the maternal environment relates to immune protein concentrations in milk collected during a longitudinal study of mothers in Krakow (n=18) and at the Mogielica Human Ecology Study Site (n=33) in Poland. Immune proteins were analyzed using triple-quadrupole/time-of-flight mass spectrometry. Guided interviews were used to collect data about participants' current and childhood environments, such as household location and composition, contact with domestic animals, and participation in agriculture. Living on a farm was associated with greater exposure to potential pathogen sources, but contrary to predictions was associated with lower levels of several immune proteins. For example, farmers had lower concentrations of Secretory IgA (mean \pm SD: 0.39 ± 0.07 g/L) than women in rural, non-farming (0.46 ± 0.28 g/L) or urban areas (0.48 ± 0.12 g/L). Understanding how mother's milk is shaped by the environment will ultimately help determine how infants use varying signals in milk to build their own immune systems, likely contributing to the variation observed in adult immune function among populations.

This work was funded by an NSF Doctoral Dissertation Research Improvement Grant (#1455455) and a Wenner-Gren Foundation Dissertation Fieldwork Grant, both awarded to LDK.

Fifteen Years of Forest Fragmentation in Southeastern Madagascar: Making sense of Fragmented Results

KATHERINE J. KLING¹, Z. ANSELMO ANDRIANDRASANA², ALEX DEHGAN³ and PATRICIA C. WRIGHT¹

¹Anthropology, Stony Brook University, ²Paleontology and Biological Anthropology, Université d'Antananarivo, ³Conservation X Labs, Washington, DC

Fragmentation of primate habitats is a dynamic process and one of immense importance for both understanding primate behavioral flexibility and guiding best conservation practices. While fragmentation is well-explored within forested landscapes, its effects are difficult to generalize, particularly as fragmentation studies are infrequently framed within a long-term context. To address the deficit in follow-through in fragmentation research, we undertook a comparative study of eight forest fragments near Ranomafana National Park (RNP) in southeastern Madagascar across two study periods: December-May

1999-2001 and June-August 2016. We conducted transect surveys (500 m; N = 192, 1999-2001; N = 62, 2016) to determine occupancy of the fragments by lemur species native to RNP, calculated current fragment size and systematically recorded signs of human disturbance. To assess species vulnerability to habitat loss across the total study period, we viewed survey results within the context of population viability analyses (PVAs) modelled using Vortex 10 of two diurnal (*Propithecus edwardsi* and *Eulemur rubriventer*) and two nocturnal (*Microcebus murinus* and *Avahi laniger*) lemur species endemic to the study region. Fragment size decrease was dramatic and wide-ranging (mean: $43.5 \pm 53.97\%$), demonstrating widely-varying historical contexts. *Microcebus murinus* was the most commonly sighted primate across both study periods, while *Propithecus edwardsi* was not observed in the latter (2016), indicating differential responses across species to fragmentation processes. This study reveals the importance of long-term research within fragmented regions in capturing compositional changes across time and space, essential for best advising the allocation of scarce resources toward conservation efforts.

Special thank you to the RW Fund and the International Primatological Society Conservation Grant in supporting this research.

Two recently excavated Megalithic gallery graves in Erwitte-Schmerlecke (North Rhine-Westphalia) from the Wartberg Culture (3500-2800 BC) with focus on the investigation of their builders

SUSAN KLINGNER and MICHAEL SCHULTZ
Anatomy and Embryology, Georg-August-University Göttingen

Knowledge about megalithic societies from the Wartberg culture (3500-2800 BC) in Central Europe is a desideratum in anthropological and archaeological research. Fortunately, two Gallery Graves could be excavated from 2009 to 2013 within the framework of an interdisciplinary research project. Amongst other skeletal elements, 1081 femora and femur fragments from grave one, 4534 teeth from grave one and 5902 teeth from grave two were examined. Methods applied were of forensic anthropological nature, for example, sorting more than 60,000 commingled bones, teeth and fragments and estimating the minimum number of individuals from one skeletal element. For paleopathological analyses, macroscopic, radiological and endoscopic examinations took place first and also low power microscopy, light microscopy, scanning electron microscopy and biochemical analyses. For the histological estimation of age at death, thin ground sections were prepared. Based on femora examination, the minimum number of individuals is 216. All age groups are present. Sex and stature were estimated and a high frequency

of deficiency diseases in children (100%) and physical strain in adults (82%) was found. The frequency of osteoarthritis in the large joints is very low (hip 7%, knee 7%). The importance of a careful excavation and examination of isolated teeth is shown by the estimation of the minimum number of individuals in grave one with 324 and in grave two with 446 buried individuals. These numbers represent more individuals than estimated before, also with respect to Megalithic tombs already investigated. Valuable conclusions about diet and the way of living could be drawn.

The project (Schu 396/31) was funded by the German Research Foundation and was part of the Priority Program 1400 (Early Monumentality and Social Differentiation).

Subadult Stress: continental Croatia vs Adriatic coast

MARIJANA KLJAJIC LUKACEVIC¹, MARISSA WOJCINSKI² and MARIO SLAUS³

¹Department of Archaeology, University of Zagreb Faculty of Humanities and Social Sciences,

²Department of Anthropology, University of North Carolina at Chapel Hill, ³Anthropological Centre, Croatian Academy of Sciences and Arts

The poster presentation will present the results of an analysis of frequency and distribution of subadult stress at the archaeological site Torcec-Cirkvisce.

The archaeological site Torcec-Cirkvisce is a late medieval and early new age cemetery. It is located approximately 125 km east of Zagreb, in the continental part of Croatia. The mortuary sample consists of 25 subadults and 60 adults. Average adult female age at death is 36.5 years, compared to 41.7 years in adult males. The frequencies of enamel hypoplastic defects are most frequent in the mandibular canines: 84.6% (n=26) exhibit one or more hypoplasia. *Cribr orbitalia* is observed in 22 (51.2%) of the 43 crania with intact orbits. The frequency of *cribra orbitalia* at the adults is 42.9% while at the subadults is 66.6%. Slightly more than 70% in the total sample exhibit at least one periosteal lesion on any bone (adults= 46.6%; subadults= 50%).

The data will be compared with three other archaeological sites: Suhopolje, Koprivno and Rijeka. Suhopolje is located in continental Croatia while Koprivno and Rijeka are located at the Adriatic coast.

Total sample from Suhopolje consists of 76 skeletons, Koprivno 146 and Rijeka 115 skeletons. About 50% of samples from Suhopolje, Rijeka and Koprivno have enamel hypoplastic defects. The frequency of *cribra orbitalia* at the samples from Suhopolje, Rijeka and Koprivno is about 25%. More than 50% in the total samples from Koprivno and Rijeka exhibit at least one periosteal lesion on any bone.