

ANNUAL MEETING ISSUE 2016 SUPPLEMENT 62

*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

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## Supplement: Program of the 85th Annual Meeting of the American Association of Physical Anthropologists March 2016

Volume 159, Issue Supplement S62

Pages 1–346

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Version of Record online: 24 FEB 2016 | DOI: 10.1002/ajpa.22955

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**Program of the 85<sup>th</sup> Annual Meeting of the  
American Association of Physical Anthropologists  
April 12 – 16, 2016**

To be held at the

**Atlanta Marriott Marquis**

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- 2 Elliptical best fits as shape descriptors: a case study on Neanderthal and modern human teeth. C.C. BAUER, P.D. BONIS, S. BENAZZI, K. HARVATI.
- 3 Dental microwear texture differences between permanent and deciduous enamel. K.L. KRUEGER.
- 4 Putting the X in Expression: Tooth Crown Morphology and Chromosome Number. C. MAIER, J. DUMANČIĆ, H. BRKIĆ, Z. KAIC, G. SCOTT.
- 5 Seeing RED: A new statistical solution to an old categorical data problem. C. WILLERMET, J. DANIELS, H.J. EDGAR.
- 6 Measurement Strategies in Dental Metrics: Caliper Measurements versus Computer Measurements Taken from Photographic Images. J.D. SYKES.
- 7 Covariation and modularity in the human dentition. A. NESBITT.
- 8 Investigating the Effects of Dental Wear on the Scoring of Morphological Traits. D.E. EHRLICH, S.E. BAILEY.
- 9 Energetic costs of eating raw foods in humans. J.B. HANNA, C.E. WALL.
- 10 Experiencing Childhood at Roonka: An Analysis of Enamel Hypoplasia in the Permanent Dentition of Australian Aboriginal Hunter-Gatherers. C.B. SMITH, J. LITTLETON.
- 11 Environment, culture and society as reflected in the dental wear and pathology of the inhabitants of the 4<sup>th</sup> cataract, Sudan. R. WHITING, S. HILLSON, D. ANTOINE.
- 12 Dietary Nuances of Late Prehistoric Agriculturists Determined Via Dental Microwear Texture Analysis. C.W. SCHMIDT, A.J. REMY.
- 13 Tooth Tales from Lima: Dental Health and Socio-Political Change Along the Pre-Columbian Central Coast of Peru. J. DEFRANCQ, K. GERDAU RADONIC.
- 14 An assessment of correlation between linear enamel hypoplasias and Wilson bands in a cemetery from the Bronze Age Levant. T.V. WILSON.
- 15 Ancient Celts: Myth, invention or reality? Dental affinities between continental and non-continental Celtic groups. M.J. FISHER.
- 16 Diet and Weaning in Late Iron Age Dorset. M.A. CLARK, J. BEAUMONT, R. REDFERN.
- 17 On the cusp of a great discovery: Dental morphology in medieval England. J.H. KUOSA, J.D. IRISH, I. DE GROOTE.
- 18 Biological affinities of Manasota Period populations in Southwestern Florida as derived from dental nonmetric traits. A.A. ELGART.
- 19 Co-occurring extreme torus mandibularis, palatine torus, and oral exostoses: a case study. L.R. LEASE, C. BOUCHIE, J.S. OHR, JR..
- 20 Evidence for intense migration influx into the Greek colony of Metaponto: A study of dental nonmetric variation. H. RATHMANN, G. SALTINI SEMERARI, K. HARVATI.
- 21 Concerning Dental Wear: an examination of macro-wear in the Erie County Poorhouse Cemetery (1851-1913). K.C. KNOWLES, J.E. SIRIANNI.
- 22 Dental characteristics of clinically diagnosed cases of congenital syphilis in the United States of America prior to 1910. S. IOANNOU, M. HENNEBERG.
- 23 The reconstruction and analysis of oral microbiome composition using dental calculus from the Mississippi State Asylum (1855-1935), Jackson, MS. J.R. BELANICH, M.K. ZUCKERMAN, H.R. JORDAN, N.P. HERRMANN, J.W. ROSCH.

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### **Genetics of Non-human primates**

*Contributed Poster Presentations.* Chair: Lisa Nevell.

#### **Atrium Ballroom A/B.**

7:30 - 8:00 Poster set-up. 5:30 - 6:00 Poster take-down. Even numbered poster authors present for discussion 10:30-11:00 and 4:45-5:30- Odd numbered poster authors present for discussion 9:30-10:00 and 4:00-4:45

- 1 A simple, economical protocol for DNA extraction and amplification where there is no lab. E.E. GUEVARA, J. RANAIVONASY, A.F. RICHARD, J. RATSIRARSON, R.R. LAWLER, B.J. BRADLEY.
- 2 Glucocorticoid mediated responses to calorie restriction, sleep deprivation and wheel running in the mouse brain and its evolution among placental mammals. L. NEVELL.
- 3 Parentage complexity in socially monogamous wild lemurs (*Eulemur rubriventer*). D.C. FRANKEL, R.L. JACOBS, R.J. RICE, B.J. BRADLEY.
- 4 Phylogenetic history of tarsiers: Uncovering the history of a deeply rooted family. R.A. MUNDS, M.H. AHSAN.
- 5 A comparative study of human and howler monkey Toll-Like Receptor 7 under the selective pressure of yellow fever virus. N. TOROSIN, K. FISCHER, J. ROUND, L.A. KNAPP.
- 6 Mitochondrial relationships of red colobus monkeys from the TL2 region (Tshuapa, Lomami, Lualaba River Basins), Democratic Republic of Congo, relative to other central African populations. M.E. CHANEY, C.A. RUIZ, J.A. HART, K.M. DETWILER, A.J. TOSI.

specimens. The fragmentary nature of the fossil record has previously resulted in disparate ordinations and rancor among paleontologists; whereas, now consensus can be calculated logically and subjectively even when component ordinations are discordant.

*Funding for data collection was provided by The Department of Anthropology of Texas A&M University.*

#### **Circumferentially drifted osteons: Detailed histology of an unaddressed modeling drift tissue and implications for general histomorphological analyses**

COREY M. MAGGIANO<sup>1,2</sup> and ISABEL M. MAGGIANO<sup>1,3</sup>. <sup>1</sup>Department of Anthropology, University of West Georgia, <sup>2</sup>Department of Anthropology, University of Western Ontario, <sup>3</sup>Department of Anatomy and Cell Biology, University of Saskatchewan.

There has been a recent resurgence in anatomical and anthropological interest surrounding the process of bone modelling drift as an indicator of variation in growth and mechanical adaptation of long bone diaphyses. Unfortunately, little is yet known about how the considerable drifting of a cortex affects cortical bone vasculature or microstructure, particularly that of secondary (or remodelled) tissues. Previous studies have focused on the endosteal lamellar pocket (ELP) as an indicator of drift direction and type. The current investigation, however, describes a particularly difficult to categorize tissue type common in drifted cortices, using examples from the humerus and femur. This tissue is comprised of pseudo-laminae constructed of circumferentially drifted osteons. These are most often first generation secondary osteons as evidenced by the reversal line around their perimeter and surrounding primary tissue. In other cases reversal lines are only partially present, or even absent entirely. Mapping the drifted cortex using stitched polarized microphotography and comparing these tissues with drifted endocortical and pericortical primary tissue, drifted osteons, and undrifted osteons supports a working hypothesis that these osteons are the result of the drifting periosteal vascular sheath on cortices parallel to the net drift direction. Results reinforce the notion that more focused consideration of the vascular aspects of cortical drift is necessary to understand the hard tissue microstructure of bone and that, in general, cortical bone histology is more complex than often admitted.

*National Science Foundation (DDIG #1061169)*

#### **Osteometric Sex Estimation from Pelvis in a Thai Population**

PASUK MAHAKKANUKRAUH<sup>1,2,3</sup>, SITTIPORN RUENGKIT<sup>1</sup>, D. TROY CASE<sup>4</sup>,

SAW MYNT TUN<sup>5</sup> and APICHAAT SINTHUBUA<sup>1,2,3</sup>. <sup>1</sup>Forensic Osteology Research Center, Faculty of Medicine, Chiang Mai University, Thailand, <sup>2</sup>Excellence Center in Osteology Research and Training Center (ORTC), Chiang Mai University, Thailand, <sup>3</sup>Department of Anatomy, Faculty of Medicine, Chiang Mai University, Thailand, <sup>4</sup>Department of Sociology & Anthropology, North Carolina State University, USA, <sup>5</sup>Forensic Science Graduate Programme, Faculty of Science, Mahidol University, Thailand.

Estimation of sex is a part of gathering a biological profile of skeletal remains. Knowing sex of unknown case can minimize half of possible individuals who may be matched with the deceased. Varieties of sexing methods from various skeletal parts can be applied. Pelvis is the most reliable. It delivers almost one hundred percentage of accuracy in estimating sex, especially using a morphological method. However, in juridical procedure, a court requires objective methods. Hence, osteometric methods are needed. Many metric sex estimation methods from pelvis have been reported. Each method is specific to its particular study group sample that it derived from. Various metric methods utilizing pelvis have been studied for Asian, but there is no standard method for a Thai population. Therefore, this study aims to develop a standard sex estimation method for a Thai population by determining six pelvic measurements and 8 indices obtained from 200 Thai samples. Independent *t*-test revealed statistical significant difference between males and females. Equations derived from discriminant analysis gave 97% and 93.5% accuracy in estimating sex. The former equation can be calculated from four pelvic measurements: ischial length, total height, acetabular diameter, and pubic length; while, the latter one required only ischiopubic index. Percentage accuracies in predicting sex from these equations were relatively high. This study provides an effective and objective sex estimation method for Thais. The high accuracy equations which require few measurements will be an invaluable method for personal identification in a Thai population.

*The authors would like to thank Excellence Center in Osteology Research and Training Center (ORTC), Chiang Mai University for their support of this project.*

#### **Biorhythms, deciduous enamel thickness, and primary bone growth in modern human children: a test of the Havers-Halberg Oscillation hypothesis**

PATRICK MAHONEY<sup>1</sup>, JUSTYNA J. MISZKIEWICZ<sup>2</sup>, ROSIE PITFIELD<sup>1</sup>, STEPHEN H. SCHLECHT<sup>3</sup>, CHRIS DETER<sup>1</sup> and DEBBIE GUATELLI-STEINBERG<sup>4</sup>. <sup>1</sup>Skeletal Biology Research Centre, School of Anthropology and Conservation, University of Kent, UK, <sup>2</sup>Department of Medicine, Imperial College London, UK, <sup>3</sup>Department of

Orthopaedic Surgery, University of Michigan, USA, <sup>4</sup>Department of Anthropology, The Ohio State University, USA..

Across mammalian species, the periodicity with which enamel layers form (Retzius periodicity) in permanent teeth corresponds with average body mass and the pace of life history. According to the Havers-Halberg Oscillation hypothesis (HHO), Retzius periodicity (RP) is a manifestation of a biorhythm that is also expressed in lamellar bone. Potentially, these links provide a basis for investigating aspects of a species' biology from fossilized teeth. Here, we tested intra-specific predictions of this hypothesis on skeletal samples of modern human juveniles. We measured daily enamel growth increments to calculate RP in deciduous molars ( $n=25$ ). Correlations were sought between RP, molar average enamel thickness (AET), and the average amount of primary bone growth in humeri from age-matched juveniles.

Results show a previously un-described relationship between RP and enamel thickness. Reduced major axis regression reveals RP is significantly and positively correlated with AET, and scales isometrically. The scaling relationship could not be explained through body mass. Juveniles with higher RPs and thicker enamel had more primary bone formation, which suggests a coordinating biorhythm. However, the direction of the correspondence was opposite to that predicted by the HHO. Next, we compared RP from deciduous molars to new data for permanent molars, and previously published values. The lowermost RP of four and five days in deciduous enamel was less than the lowermost value of six days in permanent enamel. A lowered range of RP values in deciduous enamel indicates that the underlying biorhythm might change with age. Our results develop the HHO.

#### **Putting the X in Expression: Tooth Crown Morphology and Chromosome Number**

CHRISTOPHER MAIER<sup>1</sup>, JELENA DUMANČIĆ<sup>2</sup>, HRJOVE BRKIĆ<sup>2</sup>, ZVONIMIR KAIC<sup>3</sup> and G. RICHARD SCOTT<sup>1</sup>. <sup>1</sup>Department of Anthropology, University of Nevada, Reno, <sup>2</sup>School of Dental Medicine, University of Zagreb, <sup>3</sup>Croatian Academy of Medical Sciences.

Researchers have noted differences in tooth size between individuals with a normal chromosomal complement and those with Turner (XO) and Klinefelter's (XXY) syndromes. Tooth size is decreased in individuals lacking an X chromosome but the effects are more variable when there is an extra X chromosome. How the number of X chromosomes affects tooth crown morphology is less well known. To evaluate the impact of sex chromosome number on morphology, observations were made on individuals with Turner syndrome, Klinefelter's syndrome, and a control group at the University of Zagreb School of Dental Medicine. Trait expression was scored following ASUDAS for a

standard set of maxillary and mandibular crown traits. For the control group, sexes were pooled because crown traits show little or no sex dimorphism. Chi-square tests and Fisher's exact test with the Bonferroni correction for multiple comparisons were used to evaluate the differences among the three samples. Results show Turner syndrome individuals are significantly different from either the control sample, the Klinefelter's syndrome sample, or both for UI1 and UI2 shoveling, UM1 and UM2 hypocones, and LP1 and LP2 multiple lingual cusps. For these traits, the pattern may be related to tooth size as individuals with Turner syndrome exhibit significantly lower grades of expression. The majority of crown traits did not show significant differences among the three samples. Assessing which traits are affected by variable numbers of X chromosomes will help further our understanding of the role sex chromosomes play in the development of tooth size and morphology.

#### Applying Sociopolitical Theory to Better Understand Processes of Migrant Death along the Texas-Mexico Border

JUSTIN MAIERS<sup>1</sup>, KRISTA E. LATHAM<sup>1,2</sup> and ALYSON O'DANIEL<sup>2</sup>. <sup>1</sup>Biology, University of Indianapolis, <sup>2</sup>Anthropology, University of Indianapolis.

Mass violence includes not only direct harm of one group of people at the hands of another, but also indirect harm caused by sociopolitical policies that put specific groups of people at risk. Conditions of neoliberalism in Latin America have fostered an environment of poverty and violence that leave thousands of people little choice but to flee. In turn, those arriving at the USA-Mexico border face additional dangers, such as neoconservative attitudes that dehumanize the migrants and force them into dangerous clandestine routes across harsh desert environments. As a result thousands of migrants die along the southern US border in counties unprepared and unable to address this humanitarian crisis. Brooks County has experienced some of the highest numbers of migrant deaths in the state of Texas in recent years. Given conditions of neoliberalism in the US, local authorities do not have the resources for proper forensic investigations into the identity of the deceased. Until 2013, migrants were buried in pauper's graves pending proper forensic investigation. For the past three years the University of Indianapolis has been working with other organizations to exhume unidentified migrants and conduct forensic assessments that may contribute to their identification and the repatriation of their remains to family members. This presentation will discuss the forensic science utilized in this process and will present these data in light of broader cultural and theoretical contexts to more holistically examine the processes of mass death along the border, thereby better informing our interpretations of empirical data and hypothesis testing.

#### Anthropoid grooming unguis and ancestral state estimations of second pedal unguis form

STEPHANIE A. MAIOLINO. Department of Pathology and Anatomical Sciences, University of Missouri, Interdepartmental Doctoral Program in Anthropological Sciences, Stony Brook University.

The presence or absence of a grooming unguis (often called a grooming or toilet claw) has been accorded special significance for cladistic analyses of early primates. It is generally assumed that strepsirrhines have grooming unguis on pedal digit II, tarsiers have them on pedal digits II and III, and anthropoids have nails. However, it has recently been shown that certain anthropoids do have grooming unguis on pedal digit II. This finding challenges the traditional schema because it renders the polarity of second pedal unguis states unclear. The current study examined the polarity of second pedal unguis forms using a set of 15 measurements collected from 187 second pedal distal phalanges encompassing all major extant primate genera. Measurements were size-adjusted by the geometric mean, converted into species means, and subjected to a principal components analysis (PCA) using princomp in R. Bayesian ancestral state estimations of the first two components were used to reconstruct ancestral states for major clades using BayesTraitsv2.0. Plotting the estimations into the original PCA space showed that the ancestral conditions of Primates, Strepsirrhini, Haplorrhini, and Tarsiiformes were similar to the grooming unguis of extant taxa. In contradistinction, the anthropoid estimation plotted with extant nails, indicating that grooming unguis were independently acquired by several platyrrhine lineages. These results suggest that an absence of a grooming unguis is a basal anthropoid trait and may help indicate phylogenetic affinity to anthropoids as traditionally assumed. However, future work will evaluate the robusticity of these results by incorporating fossil data.

*This material is based upon work supported by the National Science Foundation under Grant Nos. BCS-1341075 (SAM), BCS-1317525 (DMB), BCS-1440472 (DMB) and The Leakey Foundation.*

#### Dietary correlates of gut microbe composition in white-faced capuchins (*Cebus capucinus*)

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Nonhuman primate gut microbiota composition varies in response to changes in diet composition. To better understand the influence

of temporal variation in fruit consumption on the gut microbiota of primates, a group of 21-22 white-faced capuchins (*Cebus capucinus*) at La Suerte Biological Field Station, Costa Rica was followed for 12 months. Information on activity budget and diet were collected, and fruit availability was assessed at 2-week intervals. DNA was extracted from fecal samples collected during the observational study (n=170), and the v3-v5 region of 16S rRNA was amplified. Samples were individually barcoded and sequenced on the Illumina MiSeq platform. Using the TORNADO pipeline, OTUs were identified and assigned to taxa. White-faced capuchin gut bacterial communities were characterized primarily by Proteobacteria and Firmicutes. Overall bacterial community structure was not significantly influenced by fruit availability (PERMANOVA, p>0.05), fruit abundance was negatively correlated with the relative abundance of the bacteria of the genus *Megasphaera* (Spearman rank correlation; p=0.007, rho=-0.208) and positively correlated with *Serratia* and *Paralactobacillus* (p=0.017, rho=0.183; p=0.033, rho=0.163). The relative abundance of *Megasphaera* was negatively correlated with the frequency of consumption of *Psidium guava* and *Inga spectabilis* (Spearman rank correlation; p=0.007, rho=-0.205; p=0.010, rho=-0.198), *Paralactobacillus* was negatively correlated with the frequency of consumption of *Psidium guava* (p=0.045, rho=-0.154), and *Serratia* was negatively correlated with the frequency of consumption of *Hampea appendiculata* and *Dipteryx panamensis* (p=0.005, rho=-0.214; p=0.041, rho=-0.157). These results increase our understanding of how primate gut microbiomes are related to diet composition and may buffer seasonal differences in food availability.

*This study was funded by the NSF GRFP, the Lewis and Clark Fund for Exploration and Field Research, and the University of Illinois at Urbana-Champaign.*

#### Genetic and morphological variation in natural and anthropogenic marmoset hybrids

JOANNA MALUKIEWICZ<sup>1,2</sup>, REBECCA R. ACKERMANN<sup>3</sup>, NELSON HA. CURI<sup>4</sup>, JORGE A. DERGAM<sup>5</sup>, LISIEUX F. FUZESSY<sup>6</sup>, KATERINA GUSCHANSKI<sup>7</sup>, ADRIANA D. GRATIVOL<sup>8</sup>, PATRICIA A. NICOLA<sup>9</sup>, LUIZ CM. PEREIRA<sup>9</sup>, CARLOS R. RUIZ-MIRANDA<sup>8</sup>, MARCELO PASSAMANI<sup>4</sup>, DANIEL L. SILVA<sup>5</sup> and ANNE C. STONE<sup>2</sup>. <sup>1</sup>Biochemistry and Molecular Biology, Federal University of Viçosa, <sup>2</sup>School of Human Evolution and Social Change, Arizona State University, <sup>3</sup>Department of Archaeology, University of Cape Town, <sup>4</sup>Department of Biology, Federal University of Lavras, <sup>5</sup>Department of Animal Biology, Federal University of Viçosa, <sup>6</sup>Department of Plant Biology, Federal University of Minas Gerais, <sup>7</sup>Department of Ecology and Genetics/Animal Ecology, Uppsala University, <sup>8</sup>Centro de