

ANNUAL REPORT: MEXICAN BIOLOGICAL VARIATION PROJECT 2015 FIELD SCHOOL

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Mexican Biological Variation Project Study Team 2015

The Mexican Biological Variation Project field school is one of the few of its kind in existence. It is aimed at understanding the range of human biological variation both phenotypic (outward biological characteristics) and genotypic (variation encoded in genomes) present in southern Mexico. The goal of this research was to articulate with a larger study aimed at understanding human adaptation to high altitude in the Andes. By recruiting low-altitude indigenous Americans to participate, we successfully expanded our study to include data for low-altitude dwelling human populations. In total we recruited 101 participants from the city of Palenque and the surrounding towns to our study. We collected phenotypic data for a variety of physiological phenotypes and a DNA sample for future genomic analysis

Broadly, we trained our undergraduate students in field-research strategies for human biology. Each student received hands-on training for data collection of each phenotypic trait. These included: 1) skin and hair pigmentation 2) high resolution iris photography 3) 3-D facial photography 4) lung volume measurements 5) proportion of exhaled nitric oxide 6) arterial oxygen saturation level during rest and over two levels of sub-maximal exercise, and 7) DNA extraction. Students conducted independent research projects on a topic of their choice that directly related to the data that we collected during our field season. Through the facilitation of these independent research projects, students received training in quantitative data analysis, while contributing to the broad research goals of the project.

Both student participants and the Director, Abby Bigham, will present the data collected as part of this field school at upcoming national meetings. Eventually, the data will be analyzed along with existing data from high-altitude Andean populations to understand the unique genetic

changes that have occurred among these high-altitude groups that have enabled them to live in low oxygen environments. Results from this analysis will be published as articles in major academic journals.