Classification of Warm-adapted El Golfo, Mexico Equid Specimens and Evaluation of Size Differences in Accordance with Bergmann's Rule

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This study identified the species of the El Golfo equid specimens and investigated the correlation between body size and climate by comparing El Golfo and Rancho La Brea horse second phalanges. Specifically, this study evaluated effectiveness of Bergmann's rule as a method for classifying fossilized mammalian fauna. I hypothesized that equids from El Golfo of the same species should be smaller than those at Rancho La Brea in accordance with the theories posited in Bergmann's rule. This study measured six morphometrics on the second phalanx. A majority (88.9%) of the El Golfo data set was classified as E. occidentalis based on data obtained from the Discriminant Function Analysis, validating their comparison to the Rancho La Brea specimens. The MANOVA showed that the two groups were significantly different in body size ($p < 0.001$ for all measurements). This result supports Bergmann’s rule as an accurate ecogeographical model by showing that body size decreases as a phenotypic response to the environment stress of temperature fluctuations. This implication provides a crucial new dimension for extinct mammalian nomenclatural reorganization as it demonstrates the strong effect of environmental pressure on body size.

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