An Experimental Approach to Archaeomorphometrics

With Special Reference to Metapodials of Artiodactyls in Sri Lanka

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To the cherished memory and unchallenged legacy of Dr. Siran Upendra Deraniyagala

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Abstract

Taxonomic identification is a primary objective of zooarchaeology and has traditionally been facilitated by specimen morphology. As the discipline evolved newer methods, such as DNA analysis and geometric morphometrics, have become a part of the zooarchaeological toolkit. Therefore, morphometrics holds tremendous potential to fundamentally change how zooarchaeologists conduct analysis and the questions they ask. This publication presents the first attempt of the use of principal component analysis to interpret morphological differences between taxa. Despite being morphologically identified for over two decades, bones have never been examined by statistical approach. In a Sri Lankan context, using morphometrics to differentiate taxa on both prehistoric and historic sites has not been pursued with the vigour that it deserves. This research is a preliminary attempt at addressing this complex issue. The volume presents a new analytical method that aims to broaden our knowledge of the application of statistical and quantitative methods in archaeology. In addition, methods for inter-species comparison will be developed in order to determine whether morphological and morphometric characteristics varied among temporally synchronous but ecologically disparate groups. The results are promising, yielding a better comprehension of statistics and bone assemblages. How much dimensions of different bones and parts of bones vary, how they are related to each other and also how they might reflect the condition of the animal in life are key questions addressed by the research. An understanding of the relations between different measurements taken on animal bones can serve as an aid in deciding which are useful and which produce merely redundant information. Overall the work presents an in-depth analysis of morphological and dimensional features to classify the genera of hoofed animals and to create a solid base for the inclusion of metapodial characteristics in future phylogenetic analysis, which is highly informative in relation to zooarchaeological analysis.