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## **ABSTRACT BOOK**

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## Applying allometric analogies of elephantid skeletal elements to Rapid Prototyping bones

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Tilos Island, situated in the southeastern Mediterranean Sea is well known among vertebrate palaeontologists for its endemic elephant remains found in Charkadio cave. The fauna of the cave includes the endemic elephant *Elephas tiliensis* (*Palaeoloxodon tiliensis* according to other authors) and avian, deer and chelonian remains (Symeonidis, 1972; Bachmayer et al., 1976; Bachmayer et al., 1984; Theodorou et al., 2007). Research in Charkadio cave is been funded by the Research Funding Program THALES (MIS 380135). The elephant skeletal elements represent at least 75 individuals. The current study focuses on the biometry and ontogeny of selected long bones. Initially, the samples of each bone were divided into three age groups (infants, juveniles, and adults) according to their osteological characteristics. Highly correlated measurements of each separate bone were chosen in order to create mathematical equations describing allometric relationships. According to Huxley (1932) the equation of simple allometry ( $y=bx^a$ ) describes the relationship of the studied measurements. Constants **a** and **b** were calculated following the methodology described in Jolicoeur (1963). Furthermore, the same constants were calculated by curve estimation through SPSS. In a previous study (Mitsopoulou et al., 2014) it was indicated that the mathematical equations, referring to highly correlated measurements, for example in the tibia of adult individuals, showed negative allometry. The current study presents how similar measurements are expressed in different age groups in terms of ontogeny. Specimens of infant and juvenile individuals appear to follow partly the adult pattern, due to the fact that various measurements such as the shaft length, proximal and distal transverse width at the epiphyseal line and the minimal transverse diameter of the shaft, display variations in allometry. It is also worth mentioning that the study of long bones gives a good insight in the allometric growth of a skeleton and can be used for practical purposes at Rapid Prototyping printing of 3D reconstructions. The measurements derived from the allometric equations generate data that proved to be a valuable tool for the restoration of missing skeletal parts and the measurement estimation of fragmented material.

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