Toward a Better Knowledge of Elephas tiliensis Skeletal Proportions and Morphology

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Elephas tiliensis fossil bones have been excavated inside Charkadio Cave on Tilos Island, since 1971. An interdisciplinary team has been put together under the auspices of Thalis MIS380135 project, in order to fill in the missing taphonomical data and to reconstruct a complete three dimensional elephant, using Rapid Prototyping technologies. The focus of this presentation is targeted on deciding and testing the correct allometric proportions of the fore-limb and hind-limb using CT Scan and CAD manipulation software, along with classical palaeontological methodologies. Up to now there is no available material from both limbs of one animal, although different bones have been found in anatomical connection. With a mathematical formula still under development, the above methods are already producing significant data sets and in turn, alternate bone geometries. The first results are quite promising towards the reconstruction of the proper anatomical CAD model. This project is still ongoing, with very good initial results towards the three dimensional reconstruction of the Elephas tiliensis. The final 3D mechanical reconstruction will be housed in the new permanent exhibition site on the island of Tilos. The objective of this is to combine vertebrate palaeontology and state of the art Rapid prototyping technologies employed for the first time in any Greek endemic form, in reality of the last Mediterranean elephant that migrated to Tilos island from the mainland about 45.000 years and became extinct during Holocene.

Keywords: Elephas tiliensis, rapid prototyping, CAD, engineering, allometry

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