Good, fast and cheap: Photogrammetrical technique for research and conservartion on the paleontological heritage

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Digitalization is one of the principal ways for paleontologists to obtain new data from fossils. During the last decade, non invasive techniques as photogrammetry, and others as laser and computed tomography, are getting a great importance for the new perspectives and advances that are opening in this field. New and old fashioned specimens housed in the museums but also in the field can be investigated. Thus, digital libraries and databases are increasing in a fast way thanks to the new and high technologies that can be adapted for paleontological purposes. Paleontologists are looking for new techniques and methodologies that can be useful for research and conservation to obtain 3D models in high resolution, also including the texture and color of the original specimens in the fastest way to have the maximum quality data in the minimum possible time: the obtaining of these 3D models is the first step for paleontologists for different type of analysis as depth maps or biomechanical approaches using techniques such as Geometric Morphometrics or Finite Element Analysis (FEA). Herein, the photogrammetrical technique is used to digitalize different fossil specimens from museum collection but also directly in the field. Photogrammetrical technique is specially recommended for paleontological and archeological materials because it is a fast, easy and cheap technique. Photogrammetry consists in taking photographs from an object in all its perspectives maintaining the same light (position and intensity). The photographs are processed in different open access software to generate the 3D models. It should be taken into account that the result is a model, not the real object, and its resolution varies due to the characteristics of the camera used and the quantity and perspectives of photographs generated. Otherwise, different aspects such as shadows and brightness on the object can be problematic for the generation of 3D models, though light conditions are very important. In the present work, direct fossil remains as bones (from Temnospondyli: Amphibia) and indirect fossil remains as ichnites (tracks from reptiles and amphibians) are used to test the potential of this technique for conservation and research in paleontology.