The relationship between the current paleontology and medical-based technology

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ABSTRACT

Medical-based technology is broadly used for many evolutionary prospects in biostratigraphy and developmental geology. Currently, the paleontological investigations are potentially depended on these medical-based approaches. Fundamentally, these efficient medical investigations and analytic tools play a crucial role to reveal the ecological niche, life habits, adaptations and of course behaviors in extinct taxa. In this work, I present a summarized explanation on the important role of these medical-based investigations and analytic technologies in the current paleontology and fossil analysis. This study was conducted by means of comparative analysis on relevant published literature to provide a brief, more supported description on the subject. Paleontological investigations use the microscopic analyses such as professional histology to reveal many evolutionary aspects and even ontogenies in the history of life on Earth. Additionally, the computerized osteological anatomy is being numerously applied as a potential analytic tool to study paleontological characteristics of extinct vertebrate organisms, helping to envisage the taxonomic and phylogenetic features of these ancient biological components. Paleopathology in special, has already established as one of the most applicable technological research tools in current paleontology. Thus, it is essential to improve the association of medical-based technology with current biostratigraphy to reveal more detailed paleontological mysteries.

Keywords: Paleontology, Medical technology, Fossil analysis, Investigation

1. *INTRODUCTION*

As a complex, fast developing field of study, paleontology has a key role in every kind of biological and evolutionary research on the modern organisms. All of the extant natural science textbooks written by old and new generations of authors potentially rely on successful paleontological studies, revealing many developmental and evolutionary prospects in entire general biology [1]. Significantly, a specialized paleontological approach requires cooperative attempts in other relevant case studies, including geology, zoology, developmental biology, biogeography, geochemistry, geomechanics and even laboratory sciences. More recently, the medical-based technologies have brought many practical analytic tools for current paleontological studies, because nearly all of the discovered fossils are brought to specialized laboratories for scientific analyses [2]. As the consequent, our detailed understanding in many historical aspects such as dinosaur morphologies, diets, and even behaviors are potentially based on the professional laboratory and medical-based technologies which are used also for modern biological and medical research [3]. Hence, as the medical-based investigations rapidly develops through the time, more paleontological analytic tools are used for practical fossil studies [4]. Previously, it is believed that paleontology, or the study of ancient life, is primarily associated with the geological knowledge, ignoring the direct role of biological and medical-based investigations in evolutionary modeling and establishing the taxonomic hypotheses [5]. Currently, the

biological principles have indicated that most of the existent medical-based models are useful for both modern and extinct taxa.

1.1 Aims

Here, I provide a brief report to the important role of medical-based technology and biological investigation in current paleontological research alongside the geological improvement to reveal the vary, but still poor-known relationships of them.

2. METHOD

This study was performed by systematically searching the main scientific databases such as Google Scholar, Elsevier and national libraries to access the current literature published in this field of dinosaur paleontology, to ensure the comprehensive and comparative analyses The key terms were searched to find the related literature, considering the symptom terms to maximize the documented information. The methodology was continued by collecting original papers, reviews, and also the scientific books in paleontology and developmental biology. Then the saved data were analyzed and classified to cover the main implications and prospects, before the paper was written at last.

3. RESULT AND DISCUSSION

Paleontological studies are applying for numerous fundamental tools to approach the most precise, well-documented explanations about the ancient life on the Earth's surface [6]. Medical-based laboratories in particular, provide many of these vital analytic tools which recent workers from every corner of the globe must come to these laboratories and learn about the principles of such analytic tool usage. As the zoology researchers broadly rely on novel medical-based technologies to study the biological characteristics of the living organisms, they also applicate such equipment and basal principles for the fossilized taxa from every geologic interval of the life history. In particular, histological investigation is recognized as one of these potential microscopic applications, used in both medical decision makings and fossil analyses [7]. Recently, the histological investigations have revealed the evolution of feathers in both avian and non-avian Archosauria [8], the specialized and rapid growth rates in Dinosauria [9], the ecological adaptations, and also the taxonomic and the phylogenetic characteristics of ancient species that once occupied the Earth's surface. On the other hand, as the fossilized organisms are not completely preserved in most of records, it is fundamentally clear that paleontologists have to apply some supported, descriptive models of the modern medical biology for these ancient organisms_ especially their soft tissues and morphological features.

Importantly, it is widely demonstrated that the osteological anatomy is potentially used based on the modern medical basics, confirming the fact that all paleontology workers should study this sophisticated field of medical-based biology. In special, the computerized osteological anatomy is fundamentally used for vertebrate morphology (Figure 1), locomotion patterns, evolutionary innovations, and even behaviors [10 to 13]. As the reconstructed skull of a vertebrate organism is efficiently described, many medical applications are used to explain its diet and ecological behaviors. For instance, the C-T scanning has allowed us to reveal that the giant theropod dinosaur Tyrannosaurus rex was an intelligent, ambushing predator with a sensitive binocular vision alongside a keen sense of smell [14]. More importantly, a new, fast developing field of study have allowed the paleontology workers to describe the realized relationships of ancient organisms and even their interactions with paleoenvironmental circumstances. This branch, named as paleopathology, analyzes the preserved fossilized damages on the biostratigraphic materials, indicating probable pathological events experienced by the ancient organisms and to answer why did such type of damage take place [15]. In fact, the paleontological studies provide a connection point between the clinical pathology and geology, using both of fields to approach the most confident, specialized decision makings on paleobiological and stratigraphic aspects. Most importantly, further paleontological research will reveal the increasing usage of medical-based technologies and investigations in fossil record and even other geological approaches.

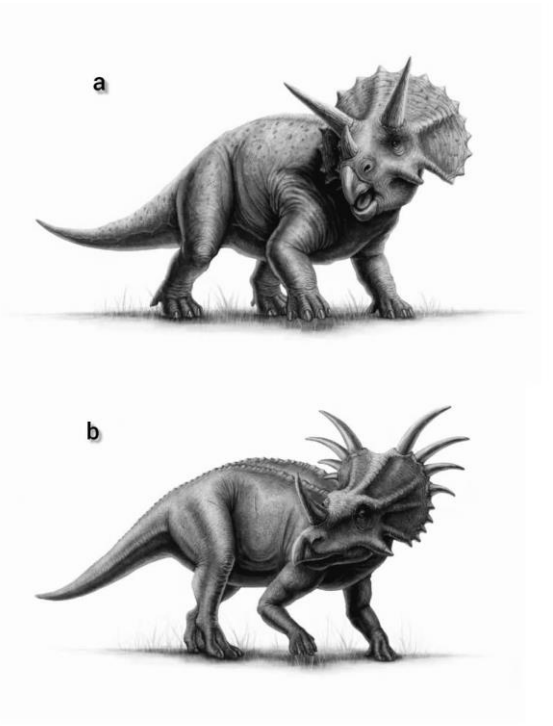

Fig 1. *Morphological disparities demonstrated by computerized osteological anatomy*
Two ceratopsian genera "Triceratops" (a), and "Styracosaurus" (b)

4. CONCLUSION

The potential role of medical-based technologies and analytic tools in precise paleontological research is undoubted, but of course poorly understood for now. It is essential to improve the association of medical sciences to current geological studies, especially the paleontological investigations to approach an interesting, well-developed series of scientific information and education.

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