

The Cretaceous Period of Weather Similar to the Present One and Its Diverse “Conchostracan” Fauna

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How to cite this paper: Gallego, O.F., Monferran, M.D., Jiménez, V.C., Zacarías, I.A., Armella, C., Nieto, D.S. and Cabaleri, N.G. (2019) The Cretaceous Period of Weather Similar to the Present One and Its Diverse “Conchostracan” Fauna. *Open Journal of Geology*, 9, 704-706.

<https://doi.org/10.4236/ojg.2019.910080>

Received: August 17, 2019

Accepted: September 22, 2019

Published: September 25, 2019

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Abstract

Cretaceous System is widely represented in South America from northeast Brazil to southern Patagonia Argentina. It is characterized by having been a relatively warm climate, with rainfall and marked seasonality which allowed the development of the “conchostracan” populations.

Keywords

Cretaceous, Climate, Fossil Record, South America

1. Introduction

The Cretaceous Period was a period with warm climate [1], with increasingly high sea levels in the epicontinental seas. The average global temperature was near to 18°C [2]. Despite the greenhouse character of the period, the cooling trend towards the Maastrichtian and the 116 Ma “cold snap” triggered the interest in possible continental Cretaceous glaciations [3].

2. Cretaceous Climate and Bearing “Conchostracan” Faunas

In the Lower Cretaceous, the monsoon circulation of the Pangea culminated, due to the opening of the Atlantic Ocean [4]. The cool interval in the Early Cretaceous is followed by warming lasting until the late Albian [5]. In the continental regions there were changes in atmospheric circulation. Wetter conditions developed and paleoprecipitations increased in tropical areas [6]. Oceanic and

continental data suggest equatorial paleotemperatures similar to the present-day [7]. This time was characterized by the presence of areas with prevailing microclimates. In intracratonic basins (e.g. northeast Brazil), the climate was arid with warm-hot temperatures. This type of arid climate, with heavy rainfall, generated favorable seasonal conditions for the development of a diverse “conchostracan” fauna. Wind patterns shew seasonality leading to more extreme climates over the continents. During the Upper Cretaceous warm weather prevailed, with greenhouse periods, globally averaged temperatures were 6°C - 14°C higher than today [8]. The paleoprecipitations increased as a result of the end of the monsoon circulation [9]. In Argentina, the conchostracan bearing units as the Lagarcito Fm. (Lower Cretaceous) was interpreted as a deposit of a shallow and perennial freshwater lake in a semi-arid climate [10]. The Cañadón Calcáreo Fm. (Upper Jurassic - Lower Cretaceous) was referred by [11] to sequences represented swampy areas, with a rich and diverse conchostracan fauna in subtropical seasonal dry climate. In Brazil-Uruguay the units are, the Botucatu Fm = Tacuarembó Fm (Late Jurassic - Early Cretaceous), indicating desert climate [12]. The Santana Fm. (Lower Cretaceous) represent tropical climate with highly dependent on the rainfall in the mating epoch [13] was, favorable to establish “conchostracan” populations. The Bauru Basin (San Carlos Fm) the climate was hot and arid [14]. The climate was warm and very dry, probably desert [14].

3. Conclusion

Finally, the climatic characterization for the Cretaceous of South America, summarized as a warm climate with rainfall and marked seasonality, allowed the development of the “conchostracan” populations so far recorded.

Acknowledgements

This is a contribution to UNESCO-IUGS IGCP Project 679.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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