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## GEODIVERSITY ANALYSIS OF "GEOPARK SERTÃO MONUMENTAL", STATE OF CEARÁ

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*Vanda Claudino-Sales*

Profa. Dr. at: ``Universidade Federal de Pelotas`` / Post-graduation Program in Geography at ``Universidade Estadual Vale do Acaraú``

*João Luís Sampaio Olímpio*

Prof. Dr. at: ``Instituto Federal de Educação do Ceará`` (Campus de Quixadá)

*Francisca Lusimara Sousa Lopes*

Superintendent of the Environmental Authority of the Municipality of Quixadá

*Alexandre Pinheiro de Alcântara*

Master's student in Geography at: Universidade Estadual Vale do Acaraú

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**Abstract:** Among the proposals for the creation of geoparks in Brazil is the "Geopark Sertão Monumental", relating to the Quixadá and Quixeramobim inselberg field, located in the Sertões Cearenses mesoregion. Given the expressiveness of the elements present there, as well as the potential for sustainable use, in 2019 the "Geopark Sertão Monumental" proposal was published by CPRM. At that time, 16 Geosites and 4 Geodiversity Sites were identified, due to the scientific and cultural importance of geological, geomorphological formations and associated functional, historical and cultural values. In this work, we propose the incorporation of two new geosites into the initial survey of the geopark proposal – these are the “Cabeça do Gigante” and “Gruta da Igreja” geosites. These geosites were identified in previous work and here we reinforce the indication with new analyses. The selection of these sites considered exceptionality, especially with regard to the unique geomorphological features in granite rocks and their appropriation by biological and human agents.

**Keywords:** "Geopark Sertão Monumental"; Inselbergs; Quixadá; Quixeramobim; Sertão do Ceará.

## INTRODUCTION

Inspired by biodiversity protection programs, the United Nations Educational, Scientific and Cultural Organization – UNESCO, from the end of the 1990s, created the program for the conservation and recognition of the world's geological heritage, called the Program Geoparks (RUCHKYS, 2009). Today, UNESCO World Geoparks, as they are officially known, consist of “single, unified geographic areas where sites and landscapes of international geological importance are managed with a holistic concept of protection, education and sustainable development” (UNESCO, 2023). The focus of Geoparks is

aimed at nature conservation, but, at the same time, it covers local communities, aiming to value culture and develop ways to improve the lives of individuals, through sustainable development.

Given the expressiveness of the geomorphological elements present in the area of the municipalities of Quixadá and Quixeramobim, in the backlands of the central region of the State of Ceará, as well as the potential for the sustainable use of this geomorphological wealth, in 2019 the proposal for the creation of "Geopark Sertão Monumental" was published (Figure 1), prepared by FREITAS et al., and published by CPRM. At that time, the initial proposal identified 16 Geosites and 4 Geodiversity Sites, due to the scientific and cultural importance of geological, geomorphological formations and associated functional, historical and cultural values.

Although the geological and geomorphological formations of this territory are a frequent subject of research, there is still a significant lack of studies that promote the sustainable use of local geodiversity. It is considered a priority to carry out new field surveys to recognize the potential of already cataloged geosites, as well as to identify new sites of relevance in terms of geodiversity, the object of this work.

## METHODOLOGY

The methodology consisted of a bibliographical survey, mainly relating to the survey of geosites in "Geopark Sertão Monumental" carried out by Freitas et al (2019), published by CPRM/SBG. This research/publication inventoried 20 sites, 16 geosites and 4 geodiversity sites. Subsequently, analyzes of the geological and geomorphological maps available on the research area were carried out. Finally, a detailed field survey was carried out within the

limits of "Geopark Sertão Monumental" area, with the aim of investigating the possibility of including two new geosites in the list.



FIGURE 1 – Location Map of "Geopark Sertão Monumental", Ceará.

Source: Olímpio et al, 2020.

In the context of "Geopark Sertão Monumental", to define the proposal to include new geosites in the initial proposal, community representatives were indicated (researchers, students, tour guides, artisans, religious), who indicated recognized cultural values for other areas not inventoried in the original proposal. The areas were verified in the field, and their granitic macro and micro forms presented grandeur in the landscape and possibilities for explaining the evolution of the plutonic relief in dry environments, which is attributed a high scientific value, which allowed them to be classified as geomorphosites.

## RESULTS ANALYSIS

The inselberg "Cabeça do Gigante" is located 6 km east of the city center of Quixadá. In the granite body, dissolution microforms predominate (MAIA et al., 2015), such as flutes, karrens, tafoni and honeycombs. This geomorphological formation is unique for the region, because taphonization reached incomparable proportions. In fact, Pedra Cabeça do Gigante is differentiated by the

connection of two tafoni located on opposite slopes of the relief, so that it is possible to traverse the granite body internally, from one side to the other, which can be explained by the etch surface model (figure 2a).

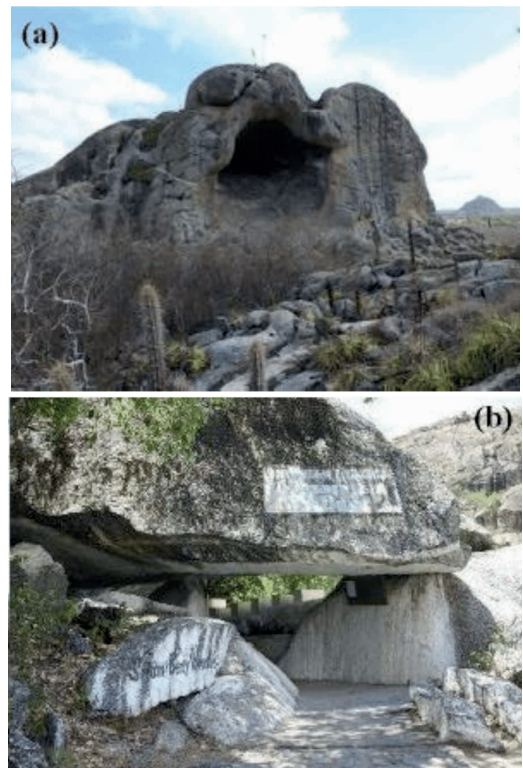


Figure 2 – Cabeça do Gigante Geosite (a) and Gruta da Igreja Geodiversity Site (b)

Source: Olímpio et al., 2020.

As for the "Gruta da Igreja" Geosite (Figure 2b), it is located half a kilometer from the Cedro dam, creating a natural shelter formed by collapsed blocks of the inselberg known as "Pedra Cabeça do Leão". This inselberg is of the fracturing type (MAIA et al., 2015). On the slopes of this granite body, features created by a pressure relief process can be observed, promoting the formation of granite blocks arranged at the base of the relief. When falling, the blocks fit together in such a way that they left empty spaces between them, enough to carry out collective practices, such as religious services. In this case, the shelter was occupied by an evangelical church, which

carries out its activities daily.

## CONCLUSION

We present a proposal for the creation of new geosites in "Geopark Sertão Monumental", which deserve the attention of researchers from different areas of knowledge, in order to understand the particularities of the granite features and their relationships

with the environmental, social, economic and cultural contexts of the territory in which they are located. emphasis. The perspective is to increasingly highlight the richness of local geodiversity, contributing to transforming the creation of "Geopark Sertão Monumental" into reality.

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