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Environmental interpretation and geoheritage in Brazilian protected areas: analysis of the Itatiaia National Park

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Keywords: Geoconservation, geoscience education, geotourism, environmental interpretation, SNUC.

Introduction

Since the 1970s, environmental interpretation has been included in the planning and management of Brazilian protected areas. From that point, several initiatives have been developed to integrate it into the regulations of national parks, management plans, the objectives of the National System of Protected Areas (SNUC – in Portuguese), guidelines for visiting protected areas, and institutional publications (Caetano et al., 2018).

Brazil has about 30 % of its territory covered by protected areas, so environmental interpretation is a crucial tool for management and conservation, as it builds connections between these areas and their visitors (Vasconcelos, 2006). Despite their importance, the number of interpretative plans in protected areas is still scarce, highlighting those elaborated by the Tapajós National Forest, Anavilhanas National Park, Abrolhos Marine National Park, and Brasília National Forest. On abiotic aspects of nature, the number of geoheritage inventories in protected areas has grown in recent years (Meira et al., 2018); however, there are still no interpretative plans and projects focused on geodiversity or geoheritage within these areas.

Whereas the abiotic elements are part of nature and are the basis for the development of organisms and ecosystems, the inclusion of geodiversity elements is of utmost importance for an integrated interpretation of nature. Based on these facts and on the new guidelines for the integration of geoconservation in protected areas (Crofts et al., 2020), this work aims to discuss how geoheritage can be integrated into interpretative activities in Itatiaia National Park, Brazil and the possibilities and challenges of these actions in other Brazilian protected areas.

Methodological procedures

The discussions presented in this work are based on the outcomes of the following research:

- (i) Review of the literature about (a) interpretation in Federal protected areas, and (b) geoconservation research in the Brazilian National Parks;
- (ii) Diagnosis of the Itatiaia National Park geoheritage and its interpretative potential based on educational and tourism uses.

Results and discussion

Research on environmental interpretation is still scarce in Brazilian protected areas. The existing projects and programmes are focused on the biotic and cultural aspects of these areas. Besides that, many national parks have research developed or in progress about their geoheritage.

Itatiaia National Park stands out as the first protected area created in Brazil, in 1937, and for its geological and geomorphological features. The inventory covering 17 geosites (scientific value), 7 geodiversity sites and 3 viewpoints (educational and tourism potentials) was carried out considering 6 geological frameworks.

The analysis of the interpretative potential of these sites was carried out based on the assessment of the educational and touristic values and the frameworks defined in the inventory. The outcomes revealed that all geological frameworks have illustrative sites with potential to be integrated into interpretative programmes and/or projects, as they reached great values in the evaluation of the educational and touristic potential.

In this perspective, the Quaternary deposits framework can exemplify the most recent processes taking place on the slopes and valleys. The Cenozoic tectonism framework can illustrate records through the existing structures on the sites. The frameworks associated with the intrusion of alkaline rocks can illustrate the processes related to old volcanism processes. Lastly, the Proterozoic igneous and metamorphic rocks framework can be used to interpret the oldest processes in the study area linked to the Trans-Amazonian Orogenic Cycle and the Brasiliano Pan-African Cycle.

Based on that, many possibilities and challenges have emerged for integrating geoheritage into interpretation activities. Thus, resolving these issues could collaborate with one of the aims of the interpretation, which is to increase the appreciation of the protected area as a whole.

Possibilities:

- Integration of the geoheritage in public use activities;
- Integrated interpretation of nature through biotic and abiotic aspects;
- Increase visitor understanding and general appreciation of the protected area;
- Training of environmental monitors on abiotic content to act as multipliers;
- Preparation of interpretative products such as folders, interpretative panels, website content and exhibitions in visitor centres, virtual products, etc.

Challenges:

- The difficulty for the public to understand geoscientific terms;
- Translate technical terms on a more straightforward approach;
- Lack of geoscience staff at protected areas to select and evaluate geoheritage;
- Management focused on biotic, historical and cultural aspects;
- Lack of geodiversity elements in management plans, strategic planning and interpretative activities.

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