

Conservation and touristic use in *Ballet* Cave, Brazil: history, present situation and future outlook

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Ballet Cave is among the most important archaeological and speleological sites in *Minas Gerais*, Brazil. The *Ballet* style¹ can be one of the oldest rock art styles identified in South America, with relative dating of at least 10,500 AP (Neves et al., 2012)². *Ballet* Cave is about 150m long, and is located in the Private Reserve of Natural Heritage - PRNH *Fazenda Bom Jardim*³, which in turn, is part of the Environmental Protection Area *Lagoa Santa* Karst. In 2002, the infrastructure project and its installation were carried out, as well as an extensive conservation work on the cave, which comprised the restoration of rock art panels. This “nationwide first” project was coordinated by Helen David, speleologist, PhD in conservation and restoration. This article presents the results of this study and the current situation of the site and the future prospects.

Visitation and Conservation Project at *Ballet* Cave/ 2002

Ballet Cave, well known in the region, received unplanned visitation until the end of the 90's. Unfortunately graffiti covered practically every smooth and accessible surface, including rock art panels (Figures 1A & B), cave walls, ceiling and speleothems. These graffiti were made with different materials and techniques, especially coal, clay, chalk, and incisions. In the 90's a barbed wire fence and gate were installed in order to protect the cave. But

that was not enough to stop the vandalism. At the beginning of the new millennium, the cave conservation status was pitiful. There was a significant amount of scattered garbage, many broken speleothems and cattle feces covered large areas of the floor. At that time, besides the graffiti, several changes on the pictorial panels were found, i.e. nests and hives of insects, animal droppings, mineral deposits (probably caused by successive applications of water to “enhance” the visual quality of the paintings), dust accumulation (possibly consequence of trampling over sedimentary layers), as described by David & Moura (2002). To protect *Ballet* Cave and other human and natural heritage places, the creation of PRNH *Fazenda Bom Jardim* was mandated by environmental agencies, and among other actions, a Visitation and Conservation Project for *Ballet* Cave/ 2002 that was coordinated by Helena David.

The Visitation and Conservation Project at *Ballet* Cave was implemented in 2002. The first steps were the cave survey, the impact mapping, and the detailed photographic survey of rock art panels and all surfaces to be restored. The photos were taken before, during and after conservation actions (Figure 2). Another important step was the implementation by the project coordinator, of solubility tests on different types of substrata (rock, speleothems). These tests enabled the development of tech-

¹This style is characterized by elongated human figures, with male and female nominees, arms raised, head and mouth often elongated and open

²Relative dating obtained for *Ballet* Style figure found in *Lapa do Santo*, *Matozinhos*, by the Laboratory of Human Evolution Studies team, led by Walter A. Neves.

³Owned by LafargeHolcim S/A.



Figure 1A- Partial view of pictorial panel in *Ballet* Cave. Photo: LA / VM



Figure 1B- Main rock art panels seen from the wooden platforms. Photo: LA/VM

niques for removal of different types of graffiti, dirt, insect nests, and animal excrements. Temperature and relative humidity measurements were made throughout the process, in order to understand the dynamics of the cave microclimate and to avoid any changes over that. The conservation work lasted about four months, and only three people⁴ were involved. It was a painstaking job, done with minimum impact techniques and control measures to safeguard the integrity of the cave environment and archaeological heritage. The second phase of the project was the planning and installation of the infrastructure. For protection of the archaeological sediment, a wooden platform was installed at the cave entrance zone and the access inside the cave was restricted⁵. Some signs were installed in addition to strategic locations, posting warnings or interpretive content to guide visitors. The platform is made of removable pallets. They were put together with flexible joints and directly supported on the cave floor. The installation process didn't call for any excavation or disturbance in the sedimentary layer, thus not causing irreversible damages to the archaeological site. The pallets provide a smooth surface, comfortable and safe for visitors. All of that entails a better

view of the rock art panels as well as it serves a better conservation of the site. Moreover this solution can be easily removed in the case of future archaeological excavations. The platforms protect the archaeological sediment from compaction and disturbance caused by trampling, avoiding the dispersion of fine particle matter, and its subsequent deposition over pictorial panels. The use of pallets made the project feasible, due to the reduced cost of installation and maintenance.

Present situation

Nowadays *Ballet* Cave receives about 600 visitors per year, mostly students. They enter the cave in groups up to 15 people, guided by a LafargeHolcim S/A employee. The cave is included in a broader preset visitation program. This visitation program lasts about two hours and includes other human and natural heritage places within PRNH *Fazenda Bom Jardim*. Visitation is held from Monday to Friday and must be booked online, 10 days in advance. A 150m wooden walkway was recently installed on the hillside forest between the dirt road access and the entrance of the cave.

Apparently, there was a significant re-

⁴ Helena David, Vitor Moura and Luciana Alt.

⁵ The access is allowed only to conduct scientific research and monitoring activities.



Figure 2 - Example surface with graffiti in *Ballet Cave* in 2001, in 2002 after Conservation Project and in 2015. Photos: VM

covery on the hillside forest in relation to the situation observed in 2002, so much so that the barbed wire fence is now better camouflaged by vegetation. The conservation status of the cave, in general, is now a lot improved. Now because of the platform fewer intrusive footprints are observed, indicating that most visitors have respected the installed infrastructure. Furthermore, it was observed that there were rare new graffiti. This attests to the theory that the existence of a large number of graffiti attracts new graffiti, and also shows that the cave management has been effective.

It should be noted that from time to time, the conservation interventions over graffiti made with incisions techniques, need to be monitored and maintained. For example, after 13 years of completion of the Visitation and Conservation Project, some points where the techniques used to camouflage incisions already need to be revised because the filler material was apparently removed by sheer natural processes i.e. stream air, circulation of small animals, etc. In some places, insect nests began to form over the rock art and other surfaces. When this kind of nest is formed over the rock art

panels, their removal can be critical and cause damage to the pictorial layers and should be performed only by specialists.

Future outlook, suggestions and recommendations

The good condition observed in 2015 in *Ballet Cave* attests to the management qualities, and because of that, it is possible to think about the expansion of the visitation circuit within the cave. In addition to rock art, the cave possesses other attractions, such as a main hall that contains historical evidence of saltpeter extraction. This main hall also contains the remainders of recent archaeological excavations. Given the importance of *Ballet Cave* it could well be included in regional touristic circuits and could be opened on weekends, without prior appointment, in order to expand the audience to the larger public.

Currently there is no monitoring program applied to the cave. Is its recommended the monitoring of cave fauna dynamics be developed in order to evaluate the possible interference of the installed infrastructure. This action is important, for example, to assess the impact of introduced construction materials over cave fauna. It is recommended to carry out an annu-

al photographic monitoring over rock art panels and other surfaces of the cave. This type of monitoring helps to identify and record possible changes (speleothems breakage, graffiti, insect nests, animal dung deposition, etc.). These monitoring actions call for the planning of immediate conservation actions. A monitoring system is an important tool for pointing out the need to review any management and surveillance actions, or even to attest to their effectiveness.

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References

David, H & Moura, V. Ballet Cave, Minas Gerais, Brasil, Conservation and Visitation. In: 10es journées de la Section Française de l'Intitut International de Conservation, 2002, Paris. L'art avant l'histoire - La conservation de l'art préhistorique. Champs-sur-Marne: SFIIC, 2002. p. 164-171.

David, H.; Souza, L. A. C.. Prehistoric rock art conservation in Peruaçu valley, Minas Gerais, Brasil. In: 10es journées d'études de la Section Française de l'Institut International de Conservation, 2002, Paris. L'art avant l'histoire - La conservation de l'art préhistorique. Champs-sur-Marne: SFIIC, 2002. p. 172-178.

David, H.; Martinez-Bazan, M. L.; Domenech-Carbo, M. P.. Contribution for prehistoric rock art conservation. In: Colours 2008. Bridging Science with Art, 2008, Évora. Book of Abstracts. Évora, 2008. v. 1.

David, H. The conservation of Ballet Cave, Brazil. In: 14th International Congress of Speleology, 2005, Atenas. 14th International Congress of Speleology. Atenas, 2005. v. 1.

Neves, W.A.; Araujo, A.G.M; Bernardo, D.V.; Kipnis, R.; Feathers, Rock Art at the Pleistocene/Holocene Boundary in Eastern South America. In: PLoS One. Oxford, 2012. v. 7, Issue 2.

