

# *SPELEOLOGICAL TRAINING IN BRAZIL: THE IMPLEMENTATION OF THE BRAZILIAN SCHOOL OF SPELEOLOGY*

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## Resumé

La Section de l'Éducation et de la Formation Spéléologique (SEFE) a été créée au sein de la Société Brésilienne de Spéléologie (SBE), en 1992. Depuis lors, plusieurs spéléologues se sont efforcés de créer l'École Brésilienne de Spéléologie (eBRe), qui a enseigné le premier cours de formation officiel pour spéléologues en 2019, impliquant 42 étudiants dans deux classes distinctes. À ce jour, le groupe de travail de cette école, a établi trois niveaux de formation: 1) cours d'introduction à la spéléologie, 2) formation en spéléologie de niveau I (cours de base en spéléologie) et 3) formation en spéléologie de niveau II (cours de spéléologie avancé). Chacun des cours a des objectifs spécifiques, permettant aux étudiants de développer des différentes activités. Les cours structurés par l'école de spéléologie étaient basés sur les lignes directrices proposées par la Fédération Portugaise de Spéléologie visant à promouvoir l'éducation de manière continue avec des spéléologues formés pour dispenser des cours reconnus par l'école. Celle-ci prévoit également, l'enrichissement des connaissances existantes, leur diffusion au niveau national ainsi que la réalisation d'actions de diffusion scientifique étendues, en particulier dans les communautés situées dans des zones proches de la présence de grottes.

## 1. Introduction

The Environmental Education Section (SEA) was included in the Speleological Education Department of the Brazilian Society of Speleology (SBE), in 1992, from a socio-environmental and speleological training course for teachers from Alto Ribeira (SP). This training course happened with support from the Apiaí Teaching Station, the regional schools and the São Paulo Environment Department. From then, several training courses for environmental monitors were carried out in Alto Ribeira and training programs for employees of State Parks that have caves in Vale do Ribeira, like Upper Ribeira State Park - PETAR (FIGUEIREDO, 1994).

In order to institutionalize the training of cavers in Brazil, Figueiredo (1997) makes a history of actions for the education and dissemination of caving in Brazil and presents his contributions to the implementation of a Speleological Formation Program in the country. In 2012 SEA was transformed into a Section of Education and Speleological Training (SEFE), in view of the efforts to implement the Brazilian School of Speleology (eBRe) and its direct relationship with the performance of activities involving environmental education. The first movements for the creation of the School took place during the 29th Brazilian

Congress of Speleology, held in Ouro Preto (MG), in June 2007. During the event, a technical cooperation term was signed with the Portuguese Speleology Federation (FPE). As a result of these actions, three workshops were held between 2007 and 2008 on the implementation of eBRe and the creation of a Speleological Training Program in Brazil (FIGUEIREDO, 2008; 2009; FPE, 1991-2016). In 2016 the projects of the creation of speleological training courses were reactivated. A new study group was constituted, and with periodic meetings concluded the Speleological Training plan, with the proper program of disciplines and workload of each level, presented at the Congress of Brazilian Speleology (34 CBE) in 2017. This model was also based on other examples of European speleological training schools such as the Federación Española de Espeleología (FEE) and the French Speleology School (EFS), which also influenced the creation of the Argentine School of Speleology, instituted by the Argentine Federation of Speleology (FAde) in 2005, during the annual general meeting (FAde, 2019). Since then, several cavers have been striving to establish the School, which officially started its formation activities in 2019, during the 35th CBE. The event had a special character, since it is also celebrated the 50 years of the Brazilian Society of Speleology (SBE).

## 2. General Standardization of Courses

So far the eBRe Working Group (GT) has achieved the standardization of three teaching stages: 1) Introduction to Speleology (Speleological Awakening), 2) Speleologist Training Level I (Basic Speleology Course), and 3) Formation of Speleologist Level II (Advanced Speleology Course). Each of the courses has specific objectives, target audience and enables the student to develop different activities.

The Introduction to Speleology Course, corresponds to the discovery of caving and must have, at least, a workload of 8 hours. It consists of raising awareness and information about the practice and ethics of speleology, oriented towards knowledge of the cave environment in an educational perspective, including the visit to a cavity. This level of education aims to disseminate and value Speleology among adults and children and adolescents. It aims to raise public awareness of the peculiarities of the cave environment from a playful perspective, through simple lectures that encompass the complexity of the underground universe. This course is aimed at environmental education and does not qualify yours by practicing speleological activity.

Introduction to Speleology courses can be organized by caving groups or other entities authorized by eBRe, under the responsibility of level II cavers. They must consist of theoretical (mandatory) and practical (highly recommended) classes, including closing dynamics and learning assessment.

The Speleologist Training Course Level I (Basic Speleology Course) consists of learning the theoretical and practical aspects of exploration techniques and safety rules, complemented by the technical approach of the various scientific aspects of speleological activity, structuring their commitment to the natural environment. It includes training in the usual techniques of progression in cavities of different morphological types and varied difficulties.

It enables the practitioner to progress in cavities that do not require vertical or speleo-diving techniques, participating and integrating teams in speleological work. They will also be able to act as monitors during the introductory and preparation courses for new members of level I courses, along with level II instructors.

Level I Speleologist Training courses can be organized by caving groups or an entity authorized by eBRe, under the responsibility of a Level II speleologist. The course consists of:

- Theoretical-practical classes;
- Visit to a karst region and to caves;
- Report of the practical part;
- Theoretical-practical exams.

## 3. Results

The first edition of the Speleologist Training Course Level I was held in June 2019 in Bonito (MS), in Brazilian midwest region, when 28 students were trained.

The course activities must take place over a minimum of 24 hours, including practical activities, never exceeding 8 hours of activities per day.

The Speleologists Training Course Level II (Advanced Speleology Course) will be taught by instructors recognized by SEFE with proven training in their knowledge area, responsible for coordinating the course with monitors with Level I training, who will accompany the group in activities theoretical and practical. The course may be attended by speleologists with Level I training, over 18 years of age, literate. Students must have practical experience in speleological activities, certified by speleological curriculum. The course consists of improving scientific and technical knowledge, basic rescue techniques, organizing and conducting speleological activities and training instructors to train speleologists at Levels I and II.

It enables the practitioner to organize and direct caving teams, especially in prospecting, reconnaissance / training, exploration and cavity topography work. The objective of the course is to train cavers responsible for the safety of the environment, for themselves and for the group, and with training for basic rescue and rescue activities (when related to vertical techniques and caving, requiring specific specializations for this purpose). It also enables to teach training courses for cavers Level I and II approved by eBRe. Level II Speleologist Training courses will be organized by eBRe or speleology groups associated with SBE in partnership with eBRe, under the responsibility of at least two SEFE members with level II training. The course consists of:

- Theoretical-practical classes;
- Training and technical exam;
- Practical exercise, with planning, exploration and execution of reports.

Course activities must take place over a minimum of 52 hours, including practical activities, never exceeding 8 hours of activities per day.

- As a complement, the student is recommended to participate in the Speleo Rescue Formation and Vertical Techniques course (self-rescue).

Two SEFE members with level II training will be responsible for the course. These will also accompany the group in practical activities. The disciplines will be taught by members of SEFE and / or invited employees with training compatible with the specific disciplines and recognized by eBRe. Each discipline must be taught by cavers with training compatible with the theme.

The results of the course were excellent, about 85% of the students classified the course with the highest score. As this was the first version of the course, some failures were observed, and will be corrected for the next editions.

The students interacted a lot, giving suggestions for improvements and all this information was compiled in the Figure 1.

In 2020 eBRe remained very active and organized the First Symposium on Speleological Education. The various lectures of the symposium addressed the history of the formation of the Brazilian School of Speleology, the teaching of disciplines related to Speleology in Brazilian Universities (Karstology, Biospeleology, Archaeology, and others) and the professional training of the speleologist at the University – in graduation and post-graduation courses, the rescue speleo and the formation of rescuers. Other initiatives for speleological education and scientific dissemination of speleology were also the subject of lectures.

There was also presented a serie of four open theoretical underground photography classes, all of which happened in the week of November from 21th to 26 th. The last activity of 2020 was the participation of eBRe in the 5th Northeastern Speleological Meeting in December 2020. The meeting happened online, and was promoted by ESPELEONORDESTE, an association of various speleological groups, speleologists and cavers. EBRé promoted an Introduction to Speleology (Speleological Awakening) course and the Speleologist Training Level I (Basic Speleology Course) as part of the activities of the meeting. The practical classes are scheduled to take place in May 2021.

That's good	What a shame	What about
<p>The course was well structured and presented in a didactic way.</p> <p>The course has excellent teachers, class structured and great equipment. Practical class with great security and learning.</p> <p>That the course teachers had specific training and knowledge to be passed on.</p> <p>That the course addressed excellent issues and focused on learning.</p>	<p>That there was no presentation of equipment and techniques of horizontal progression.</p> <p>The topography class is introductory but it was unclear how effectively a map is produced and what are the minimum elements needed on a map (scale, north and geographic coordinates, legend and sections / profiles).</p> <p>I missed more detailed explanations of how the different types of speleothems were formed.</p> <p>Dense content for short time.</p>	<p>Work to involve more cavers, so the next editions are even better.</p> <p>Focus on techniques of minimal impact, risk management, interpretation of maps at Level I. Increase the hourly load of such content, decreasing from other subjects that could be better explored at Level II.</p> <p>More practical activities, both in the classroom and in the field.</p> <p>Do other classes in all regions of Brazil.</p>

Figure 1 : Table containing students suggestions for improve the Speleologist Training Level I (Basic Speleology Course).

At the moment the eBRe Working Group (GT) continues in the preparation and improvement of the didactic material for the training courses. Besides that, eBRe is trying to add

another groups and collaborators, in a joint effort to contribute to a quantitative and qualitative growth of speleology in Brazil.

## 4. Discussions

Over the last four years the eBRe Working Group (GT) has advanced in the formatting of Introduction to Speleology courses and for the training of Speleologists Levels I and II, with the final approval of their basic courses. The launch of eBRe at the 35th Brazilian Congress of Speleology (CBE) was the first step towards the continuous dissemination of knowledge about karst and caves in Brazil. In addition to the involvement of the national speleological community, this intends to trigger the training and recognition of speleologists as actors in the spread of speleological knowledge. So that, the different regions of the country will contain leveled speleologists for the administration of courses recognized by eBRe. With that, it envisions the improvement and leveling of the existing speleological knowledge and propagated at national level.

Currently, the proposed structure contains the following steps:

- 1) Introduction to Speleology (Speleological Awakening) – 8 h,
- 2) Speleologist Training Level I (Basic Speleology Course) – 24 h, and
- 3) Formation of Speleologist Level II (Advanced Speleology Course) – 54 h.

Its organization and realization will take place in independent courses promoted by eBRe and / or in partnership with the national speleological body, through groups, educational institutions and / or conservation units with an interest in the area.

The course structured also provides the training of instructors and specialists in different areas related to caving.

The elaboration of the school's guiding documents does not intend to be immutable, being the beginning of its practice essential to evaluate the course that this initial proposal will

make possible. According to the evolution of the actions related to the School, it will re-evaluate the effectiveness and potential of its process, always seeking the continuous improvement of the training promoted by it. EBRé members sought to establish a common basis for the training of cavers, judging the importance of environmental education and the rules of exploration and safety in the underground environment in the process of building knowledge in the area. These principles should guide the development of learning by present and future national cavers. They must have in their fundamentals the responsibility for the respect and safety of the environment, of the tour group and of themselves.

## 5. Conclusion

Speleology has been growing in Brazil in recent years and new formal groups and associations of speleology have been emerging. Each of these groups had been forming its new speleologists according to their possibilities, experience and formation of their members. Often, however, these formations presented disparities. The need to have a differentiated guideline in the formation of new cavers that caused the creation of the Brazilian School of Speleology.

The institution's next steps are to establish the requirements for the improvement courses, to deepen in specific themes, and to format specific didactic material for each level of education instituted in the school. The improvement course will focus on its objectives in the training of cavers specialized in topics such as mapping, bio-speleology, hydrogeology, among others.

The eBRé, for the realization of its objectives, needs the involvement of cavers at the national level, through the execution, evaluation and suggestions about the learning process of the participants.

All groups and associations of speleology in Brazil now have the support and guidelines of eBRé for their courses. So those who meet the requirements and the official program of theoretical minimum content and field practice, leave with a certification issued not only by the responsible speleology group but also by eBRé/SBE. This means that these groups can count with eBRé to carry out their courses, as well as the group itself to carry out the course, if it has a teaching staff prepared, counting on the support and supervision of eBRé.

## Acknowledgments

*To all who contributed in some way to the foundation of the Brazilian School of Speleology (eBRé) to become a reality.*

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