

Virginia Cave Board Recommendations on Lampenflora Abatement

December 18, 2011

The Virginia Cave Board is concerned with maintaining the natural condition of speleothems within caves to the greatest extent possible. The Board recognizes that this can be a challenge to cave management, especially within caves that have lighting systems installed. Artificial lighting within caves promotes the growth of algae, moss, ferns, and other photosynthetic organisms, collectively called "lampenflora." The Cave Board has reviewed the Virginia Region cavers' methods of lampenflora abatement and considers them to be right in line with current best practices.

From a biological point of view, the less cleaning of speleothems the better. However, removing existing lampenflora is a desirable goal of good cave management. To this end, the Virginia Cave Board makes the following recommendations:

- Do not use bleach to clean formations. While a 5 percent bleach solution kills lampenflora, it is not recommended because it releases toxic chlorine gas and possibly carcinogenic chlorinated compounds, and it may kill the native cave biota.
- The current best practice is to use a spray bottle to apply a 15 percent solution of hydrogen peroxide to affected formations. This is much more environmentally friendly. If feasible, the washing solution and resulting detritus should be contained and removed. The main drawback to the use of hydrogen peroxide is that it is acidic (pH 4) and may be slightly corrosive to formations and limestone.
- Mechanical removal should be minimized, but if necessary, it should be done cautiously with soft, nylon-bristle brushes. Mechanical removal with water and brushes is not sustainable because fragile formations may be destroyed.
- Rinsing with cooled, boiled tap water is also recommended. If your water supply has chlorine added, you should let this "rinse water" sit out for several hours. This has the same effect as boiling in that it allows the release of any chlorine.

VAR cavers use hydrogen peroxide in a 15 percent solution sprayed on speleothems. They let it sit for 20 to 30 minutes, then rinse with water. If need be, they then use nylon-bristle brushes to gently clean off any remaining algae. They clean up whatever runoff occurs from this process. This is done after they determine that cleaning with water only will not be sufficient. On areas where decades of gravel dust has built up, they use water and nylon-bristle brushes to gently clean the formations.

The Cave Board hopes that you will seriously consider our recommendations. We would be pleased to discuss this matter with you further.