

## **Radiological Study in Caves of Southwest Brazil**

**Alberigui, S.<sup>1</sup>, Silva, P.S.C.<sup>1</sup>, Campos, M.P.<sup>1</sup>, Damatto, S.R.M.<sup>1</sup>, Pecequilo, B.R.<sup>1</sup>,  
Mazzilli, B.P.<sup>1</sup>.**

Instituto de Pesquisas Energéticas e Nucleares – IPEN. Av. Prof. Lineu Prestes 2242,  
CEP: 05508-000, São Paulo, Brasil. [pscsilva@ipen.br](mailto:pscsilva@ipen.br)

<sup>1</sup>Environmental Radiometry Laboratory LRA.

The *Parque Estadual Turístico do Alto Ribeira* (PETAR) is located in the Southwestern part of São Paulo State, in Ribeira Valley. In this region is found the major number of cave occurrence in Brazil and also shelters the most visited caves of the country. Caves, usually located in a karstic zone, are characterized by the presence of carbonaceous rocks frequently fractured and collapsed. Carbonates (dolomites and calcite rocks) usually have low U and Th, however, surrounding rocks can be found containing in structural positions U and Th. Radon generated in these rocks may migrate in the subsoil penetrating this carbonate due to its greater permeability causing high radon concentration. It is known that radon emission depends on conditions of the local micrometeorology, geological factors and the concentration of U and Th Decay series. In the sense to understand the radon concentrations in these caves, the objective of this paper is to determine the <sup>238</sup>U, <sup>232</sup>Th, <sup>226</sup>Ra, <sup>228</sup>Ra and <sup>210</sup>Po in rock, soil and sediment samples by alpha spectrometry and total alpha and beta measurement. The concentrations of radon and thoron in the air's cave were determined in air by solid state nuclear track detectors. As a complementary study neutron activation analysis also were performed in soil, rock and sediment samples.

Six of the most visited caves, named Santana, Água Suja, Morro Preto, Couto, Alambari and Laje Branca were studied. High radon concentrations were found in Santana Cave, the same with higher concentrations of U and Th.