

Variation of Indoor Radon Levels in Some Caves of Parque Estadual Turístico do Alto Ribeira (PETAR), SP, Brazil with Ventilation and Rain

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ABSTRACT

Radon and their progeny are always present in the open atmosphere, however, in the confined atmospheres of underground workplaces like natural caves, their levels can reach higher concentrations. Petar, Parque Estadual Turístico do Alto Ribeira (High Ribeira River Turistic State Park), created in 1958, is a conservation park with an area of 35,102.8 ha, situated on the left margin of the Ribeira river, in the south of São Paulo State, Brazil, with more than 180 recorded caves. The park gathers four visit centers: Santana, Caboclos, Ouro Grosso e Casa de Pedra, receiving annually nearly 40,000 visitors. Radon survey in several galleries of the most visited caves of PETAR from October 2003 to November 2005, carried out with Makrofol E tracks detectors, showed average levels varying from $153 \pm 44 \text{ Bq.m}^{-3}$ to $6358 \pm 1619 \text{ Bq.m}^{-3}$ for radon. The results from the 25 months study were evaluated, showing that the wide variation between the minimum and maximum concentrations values are strongly related with cave ventilation. In order to establish other factors contributing to this variation, beside the well known temperature effect, rain data over the entire period were also considered, showing that, apparently, radon concentrations inside the caves decrease with drought.