



DATING MOLLUSKS SHELLS FROM MALHADA MARSH, BÚZIOS, RIO DE JANEIRO.

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Malhada Marsh, County of Búzios, State of Rio de Janeiro is part of low lands. In the Holocene, from 5000 to 4000 years ago the sea-level reached about 2.5 meters above present sea-level and the region above mentioned was completely flooded. Those were not short period of time during which a large number, millions or billions of mollusks proliferated. Dead mollusks precipitated forming layer as large as 50 to 60 cm of shells. These layers of shells can be seen in any wall of ponds that are found there. Shells from three layers, one about 20 cm below surface MM3, two, 20 cm below, MM2 and three. 20 cm lower, MM1 were collected. Selecting four or five non-fragmented shells, each with more than about 1, 2 grams. individually each one was crushed and sieved retaining grains with sizes between 80 μ m and 180 μ m. Keeping identity of each powder, each one was divided into 6 to 10 portions, each with about 14 mg mass, and put into small envelopes, they were irradiated with γ -rays with 10, 20, 60, 100 Gy. The read-out TL intensities were plotted as function of dose (this is the additive method) and extrapolating the obtained curve (most of the time straight line) to negative dose-axis, the intersection is a negative dose whose absolute value is called accumulated (or paleodose), Dac. Dac is just the dose each shell received from radiation produced by surrounding sediments. These sediments emit radiation due to nuclides existing in the sediments as daughters in the two radioactive series, U (238) series and Th (232) series. K (40) is radioactive and emits in the course of time β and γ -rays. Here we used γ -spectroscopic method to find concentration of U(238) in ppm, of Th (232) also in ppm and K (40) in %. There exist Tables such as Table 45 in Ikeya (1993) New Applications of Electron Spin Resonance book that allows estimating annual dose rate, Dan, of the radiation from sediments. The desired age is given by Dac/Dan. The result indicates that shells from bottom are older than those from middle or close to the surface, the ages varying from 4800 – 4900 to 4500-4200 and to 4000 to 3800 years B. P. Shells in the 4800 to 4600 years B. P. period precipitated to the bottom of sea and were covered with sediments containing radiation sources and therefore they are oldest ones. These shells are good indicators of what happened in the Holocene period.

Keyword: Thermoluminescence (TL), (Dac) Accumulated Dose, (Dan) Annual Dose.

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