MUTAGENIC EVALUATION OF THE WATER SOLUBLE FRACTION OF AIR PARTICULATE MATTER USING THE SALMONELLA/MICROSSOME ASSAY: A PRELIMINARY STUDY

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The air in urban areas contains many environmental pollutants derived mainly from fuel combustion and industrial processes. Heavy metals, associated with particulate matter, have proven to have toxic effects and can also be mutagenic. Mutagenicity assays like the *Salmonella*/microsome assay have been widely used to evaluate the presence of these substances in complex environmental mixtures. The assay uses a variety of *Salmonella* Typhimurium strains sensitive to different classes of substances. The strains TA98 and TA100 are extensively used in environmental monitoring because they can detect most classes of mutagenic compounds, detecting frameshift and base-pair substitution mutations, respectively. The TA97a strain detects frameshift mutations and is more sensitive to the action of heavy metals. This preliminary study aimed to evaluate their sensitivity to the detection of the mutagenic activity in the aqueous extract (soluble fraction) of air particulate matter. The samples evaluated were from four monitoring stations in the Metropolitan Region of São Paulo (Osasco, Pinheiros, Ibirapuera and Capuava) and one in an industrial area of Cubatão (Vila Parisi). Particulate matter was collected in glass fiber filters during 24 hours in High-volume samplers (HI-VOL). From each sample half filter was fractionated and subjected to extraction by sonication in 50 mL ultrapure water, for 30 minutes, and then filtered through 0.22 µm membrane. The extracts were tested with the reverse mutation assay - Direct Method, with *Salmonella* strains TA98, TA100 and TA97a. A sample was considered mutagenic when results showed statistically significant dose-response relation and mutagenicity index (MI) ≥ 2.0. None of the samples could be classified as positive using this criteria, althouth some have showed a tendency to positivity. The MI values were slightly higher in samples collected in the month with less precipitation values, suggesting a higher concentration of mutagenic compounds. The higher MI value (1,6) was obtained from the filter collected in the station influenced by petrochemical industries. The methodology applied in this study, still being improved, was a new strategy to understand the genotoxicity of inorganic compounds soluble in water and bioavaible in the atmosferic environment.