Abstract Title:

GENOTOXIC POTENTIAL AND GENE EXPRESSION INDUCED BY ORGANIC EXTRACTS OF TOTAL PARTICULATE MATTER FROM DIESEL BLENDING WITH 10% ETHANOL OR WITH BIODIESEL 10%.

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Abstract:

The principal contaminant in the air of most cities is particulate matter (PM) from engines that use fossil fuels like diesel and this PM is causally correlated with morbi-mortality for different diseases. Offer of different mixtures of bioalcohols or biodiesel with fossil diesel around the worldwide as alternatives to pure diesel, but the toxicity of PM emitted by these mixes are not taken into account. Determine the mechanisms of toxicity of PM alternative fuel mixtures because it permits to predict the hazard to environmental and human health exposed to those emissions.

The present research compares the toxicity of organic extracts of PM emitted by a pre-Euro I with pure diesel, blend diesel with 10% sugar cane ethanol or blend diesel with 10% palm biodiesel, used commercially.

The toxicity analyses were done in vitro taking into account the mutagenic potential in bacteria (*Salmonella* /microsome test), the genotoxic potential in the HepG2 cell line and the differential global expressions of genes by means of the RNA sequence.

The analyses showed no difference among the organic extracts of PM in diesel and the mixtures with 10% ethanol and 10% biodiesel in so far as mutagenic and genotoxic potential in the comet test. With respect to differential gene expression, the organic extract of PM in biodiesel regulated 343 genes, while 10% ethanol 177 and diesel 96, the majority overexpressed with respect to the control group. The principal functional routes impacted by the 10% biodiesel extract were principally related to the immune system and transduction signals mediated by the receptor of factors in fibroblast growth. The 10% ethanol affected the extracellular matrix, in carbohydrate metabolism and transduction signals related to vascular epithelia. The results could integrate with the different health effects and be used to predict the environmental and human impact from exposure to PM.