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Title: Long-term effects of biomass burning exposure on nasal mucociliary clearance in Brazilian sugarcane cutters

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Body: Nasal mucociliary clearance (NMC) is the main defense mechanism respiratory against inhaled particles and there is evidence that exposure to biomass burning particles cause adverse effects on this system. This study aimed to evaluate the long-term effects of sugarcane biomass burning exposure on NMC in sugarcane cutters during a harvest. Fourteen non-smokers sugarcane cutters (mean age 25±4 years old, BMI 24±2 kg/m2) were evaluated. The NMC was measured by Saccharin Transit Time (STT) test in pre-harvest, three and six months of harvest. Air quality was evaluated at harvest, in which occurs biomass burning, by the passive sampler in the third and sixth month being measured heavy elements cadmium (Cd2+), copper (Cu2+) and lead (Pb2+). Shapiro-Wilk test was used to assess the normality of the data and the ANOVA test was used for STT measures and Bonferroni's post-test to detect the differences. The test t was used to compare the values of trace of heavy elements at moments. Statistical significance was determined at 5%. The STT test decreased significantly at three (4±2 minutes) and six months (3±1 minutes) of harvest compared to pre-harvest (8±3 minutes, $p<0.001$). Among trace metals, Pb2+ was predominant (0,3 ppm/cm2 - three month and 3,4 ppm/cm2 - six month) while Cu2+ presented the lowest concentration (0,05 ppm/cm2 - three month and 1,5 ppm/cm2 – six month). The Cd2+ concentrations were 0,04 ppm/cm2 (three months) and 2,1 ppm/cm2 (six months). Our study demonstrated which long-term exposure to biomass burning from sugarcane accelerated the nasal mucociliary clearance.