Investigating the Long-Term Pulmonary Function of Cornu Aspersum Through Household VOC Exposure

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Fragrance products have been on the rise in popularity recently. Volatile organic compounds (VOCs), which are toxic airborne chemicals, have shown to be most prominent in the product's ingredient, parfum. As cases of chronic obstructive pulmonary disease (COPD) gradually increase, additional exposure to VOCs raises concerns about their impact on lung function and overall public health. This study will investigate the potential pulmonary effects of VOCs emitted from selected air fresheners through the bioaccumulation model organism, Cornu aspersum. The measurement of CO2 respiration, mucus production, lung inflammation and pneumostone diameter examines pulmonary effects through prolonged exposure. Each control group was exposed to parfum products increasing in concentration: Febreze Linen and Sky, Febreze Heavy Duty Crisp Clean Air, and Bath & Body Works Gingham Room Spray. The functions tested, respiratory rate, airway constriction, and irritation response, were done by measuring CO2 production, pneumostome diameter, and mucus production/wet-to-dry lung weight ratio (LWR), respectively. Observing long-term changes, from weeks 0-9, average CO2 production experienced a significant decrease. There was a significant decrease in respiration rate, aiding the claim that respiratory suppression occurred throughout the experiment. Mucus production and LWR increased from baseline, and there was a decrease in pneumostome diameter, supporting inflammation of the pneumostome, similar to airway inflammation or mucus development around its smooth muscle. The results show that the chosen air fresheners harm the bodily function of C. aspersum, which can be used as fundamental data to replicate the effects of air fresheners, household VOC products, on the human respiratory system.

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