STUDY OF SOIL'S QUARTZ GRAINS AS A SOURCE OF POTENTIAL AIR POLLUTION

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The presence of substances and mineral particles in the air may be harmful to health when are inhaled repeatedly. Among these substances, small particles of crystalline silica (<5 μm) are recognized. Potentially, the soil is a medium of input of particles into the atmosphere by deflation and transport (movement) by the wind. Among the great diversity of soil mineral particles, the quartz is abundant and is shown from macroscopic sizes up to silt size (50-2 μm) and even up to clay size (<2 μm), making it as material for take into account in environmental toxicity studies. Classically, it had been considered a mineral of low chemical reactivity but new studies about soil, by our Research Group, have questioned this paradigm (Spanish Ministry of Science and Innovation project no CGL2009–10671 "Revisión del paradigma de la inalterabilidad del cuarzo en suelos mediterráneos"). In this paper we propose the use of a methodology for the study of quartz grains in soils as a potential source of disease by repeated inhalation of those mineral particles. The methodology is based on a specific process by pretreatment of quartz grains of fine sand (50-250 μm) and silt (50-2 μm) fractions, detailed observation with SEM (with coupled EDX) of statistically selected grains, followed by classification in morphotypes, imaging analysis and statistical interpretation of results, with the final establishment of relative harmfulness indexes. This multi-technique has been applied to the quartz mineral from surface horizons of five modal soils from the most characteristic landscapes from the vicinity of the Granada's city.

Keywords: air pollution, quartz mineral