

NATURAL ASBESTOS OCCURRENCES IN SOUTHERN APENNINES AS A CONCERN TO HUMAN HEALTH: MINERAL FIBRES CHARACTERIZATION

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Today, it is widely accepted by the scientific community that the exposure to asbestos brings to the development of negative health issues (IARC, 2012; Harper 2008; Baumann et al., 2015). Although many countries banned the use and the commercialization of asbestos, the environmental exposure of people still represent a big concern. In fact, the Natural Asbestos Occurrences (NOA) interest some areas of the Italian territory as well as various parts of the world (e.g., Harper 2008, Bloise et al., 2021). Ophiolite rocks (i.e. serpentinite and metabasite) are the main lithotypes associated with NOA since asbestos minerals are the major constituents of these rocks. Moreover, derivative soils inheriting the mineralogical and geochemical characteristics of the bed rock may contain hazardous fibres, thus representing a source of risk to human health (Punturo et al., 2018; Ricchiuti et al., 2020). The hazard is based on the potential inhalation of mineral fibres dispersed into the environment because of weathering processes (e.g. erosion) or human activities (e.g. road construction, excavation, agricultural activities) that may disturb NOA thus causing the release of dust containing respirable fibres into the air.

Another notable aspect is represented by the capability of fibres to host potentially toxic elements (PTEs; i.e., Fe, Cr, Ni, Zn, Mn, Co and REEs), which may be released into the organism thus causing health issues (Bloise et al., 2020).

In this scenario, the present contribution aims to show the activities of our research group conducted on rocks (serpentinite and metabasite) and derivative soils samples occurring in the Southern Apennines. The main goal of our work is to show as the rock samples may be characterized by using various analytical techniques (i.e. OM, SEM-EDS, TEM-EDS, XRPD, XRF, ICP-MS, SR- μ CT) in order to determine the presence of asbestos fibres as well as that of PTEs, if any.

Results of our studies, showed that Southern Apennines are characterized by asbestos fibre occurrences (e.g. chrysotile, tremolite, actinolite) and that in some areas the concentration levels of toxic elements such as Cr, Co, Ni and V in serpentinite rocks and derivative soils exceed the regulatory thresholds for public, private and residential green use (Punturo et al., 2018). In this

regard, the PTEs quantification is essential to limit exposure and minimize the public health risks for people living in these geological contexts.

Finally, with our research activities we want to: i) improve the characterization and quantification related to asbestos fibres contained in both ophiolite rocks and derivative soils; ii) provide data for compulsory Italian asbestos mapping; iii) identify eventually health hazard areas owing to asbestos and other fibrous minerals presence.

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