

MESOTHELIOMA INDUCING MINERALS IN CAPPADOCIA: COMPLETE MINERAL CHARACTERIZATION BY SEM-EDS-XRD

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Residents of the three “meso” villages of Cappadocia, Turkey have history of very high percentages of malignant mesothelioma (MM) as both malignant pleural mesothelioma (MPM) and malignant peritoneal mesothelioma (MPEM). Unfortunately, most houses in these villages were made from volcanic tuffs obtained from nearby sources, which are contaminated with erionite series minerals, the most carcinogenic minerals known and listed as a Group-I carcinogen for humans. Some of these villages moved to the new locations. For example, many villagers from Sarihidir were carried construction materials from their “old” houses to the “new” village and used them as construction materials either in their new houses or as garden walls. In this study, complete mineralogy of the rocks – not just erionite – have been investigated in detail and hoping that this could be a model for future investigations in quantitative mineralogy-mesothelioma relationships. The following minerals are observed: (i) Zeolite group minerals include erionite, clinoptilolite, chabazite, mordenite, faujasite, stilbite, phillipsite, epistilbite, laumontite, and paulingite; (ii) Clay minerals include montmorillonite, illite, rectorite, nontronite, and beidellite; (iii) Other rock forming minerals include: (a) silica: quartz, tridymite; (b) carbonates: calcite, dolomite, vaterite; (c) micas: biotite, lepidolite, vermiculite, phlogopite, zinnwaldite, muscovite; (d) feldspars: albite, andesine, anorthite, labradorite, bytownite, orthoclase, sanidine, anorthoclase; (e) feldspatoid: analcime; (f) evaporitics: gypsum, anhydrite, halite; (g) others: sepiolite, palygorskite, jarosite, volcanskoite, fayalite, enstatite, clinochlore, magadiite, wilhendersonite, swinefordite, antigorite, and alunite. Erionite is present in all samples collected from “meso” and “non-meso” houses. Erionite is observed in garden wall rocks of the public primary school and coffee house – the daily meeting places of the “New” Sarihidir village people. This shows that the villagers are still being exposed to erionite, although presumably in smaller quantities than at the “Old” Sarihidir village.

Keywords: erionite, mesothelioma, Cappadocia