

# ELEMENTAL, ORGANOCHLORINE AND PAH COMPOSITION OF ATMOSPHERIC FINE PARTICLES DURING AFRICAN DUST EVENTS IN EASTERN MEDITERRANEAN

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The Mediterranean receives large amounts of dust, emitted from regions of the Sahara-Sahel-Chad corridor, which affects ecosystems, climate and human health. We report a two-year study (2012-14) monitoring the elemental enrichment, the POPs (PCBs and OCPs) and PAHs composition of fine particles during African dust events (ADEs) on Crete (Greece). Twenty-four h samplings sessions have been conducted in a semi-rural area. PM<sub>10</sub> and PM<sub>2.5</sub> and gas phase samples have been collected and analysed by ICP-MS, GC-NCI, EI/MS. The average concentrations of <sup>27</sup>Al, <sup>57</sup>Fe, <sup>55</sup>Mn, <sup>44</sup>Ca and <sup>24</sup>Mg, of ADEs samples, showed the highest enhancement among the major elements by a factor of 5-17, vs. not affected samples. Lanthanides had higher levels during the ADEs, 4-19 times higher values. The  $\Sigma_6$ PCB most common congener average concentration was 5 pg/m<sup>3</sup>, similar with the concentrations reported during ADEs in Eastern Caribbean and Cape Verde, while the total PCB concentration in the current study ( $\Sigma_{48}$ PCB congeners) ranged between 47-158 pg/m<sup>3</sup>. The concentration of the most common OCPs such as aldrin, chlordanes, DDX, endosulfans, hexachlorocyclohexanes, heptachlor, hexachlorobenzene, dieldrin, chlorothalonil, and dicofol were 0.10, 2, 25, 5, 6, 1, 16, 7, 3, and 6 pg/m<sup>3</sup> respectively. Dieldrin, chlordanes and HCHs levels were similar to those of Mali. Almost all OCP concentration levels we determined were similar to those detected in locations downwind of African dust regions, offshore of West Africa, Trinidad, Tobago, and Virgin Islands. The  $\Sigma_{35}$ PAH average concentration of PM<sub>2.5</sub> was 1.5 ng/m<sup>3</sup> and did not demonstrate a strong differentiation between ADE and non-ADE samples.

**Keywords:** African dust, PM<sub>2.5</sub>, ICP-MS, GC-MS, major elements, lanthanides, organochlorine pesticides, PCBs, PAHs

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