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Supplementary Information

Study of Black Sand Particles from Sand Dunes in Badr, Saudi Arabia Using Electron Microscopy. *Atmosphere* 2015, *6*, 1175-1194

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1. When looking at a cross section of a black sand particle (Figure S1), we observe that there is a white interior with a black coating on the outside. In this image (Figure S1), taken with the stereo

microscope, the particle on the left shows where the surface coating was removed and the white core exists. The magnetic black sand clearly depicts the reddish iron oxide particles.

2. Elemental determinations were performed to indicate the possible chemical species and quantities present. Figure S2 illustrates the elemental characterization comparisons of the magnetic black, non-magnetic black, white, and volcanic sand. In the energy range up to 7.5 keV, the following elements were detected: C, O, Na, Mg, Al, Si, P, S, K, Ca, Ti, V, Cr, Mn, and Fe. Carbon, O, Na, Mg, Al, Si, K, Ca, Ti, and Fe peaks were observed at 0.28, 0.53, 1.04, 1.25, 1.50, 1.74, 3.31, 3.69, 4.51, and 6.40 keV, respectively. These elements are the most common, found in varying intensity in all samples.
3. Comparing with the white sand and volcanic ash, the magnetic black sand has a different characteristic, contain C, O, Na, Mg, Al, Si, P, S, K, Ca, Ti, and Fe (Figure S3).

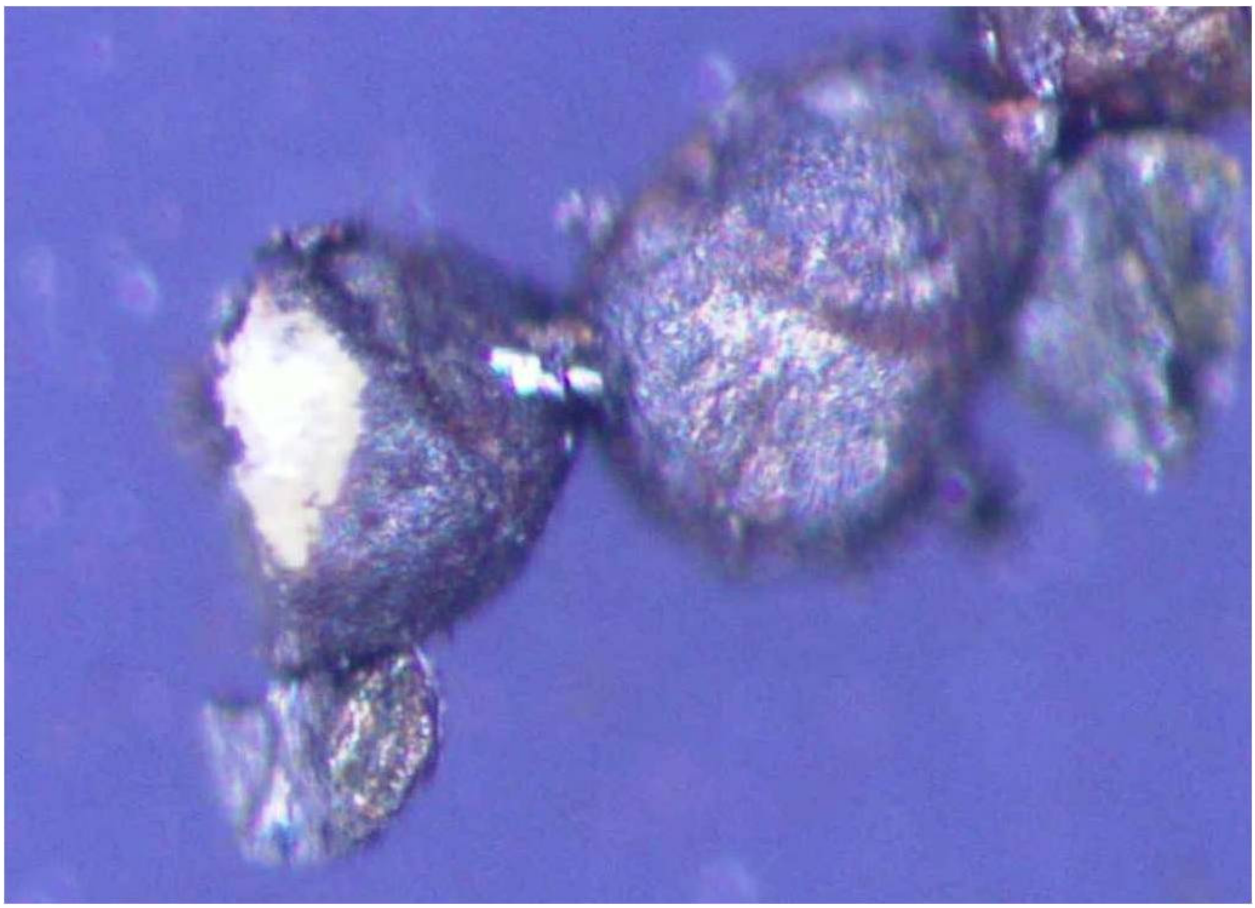

Figure S1. Stereo microscope image of magnetic black sand (90x magnification).

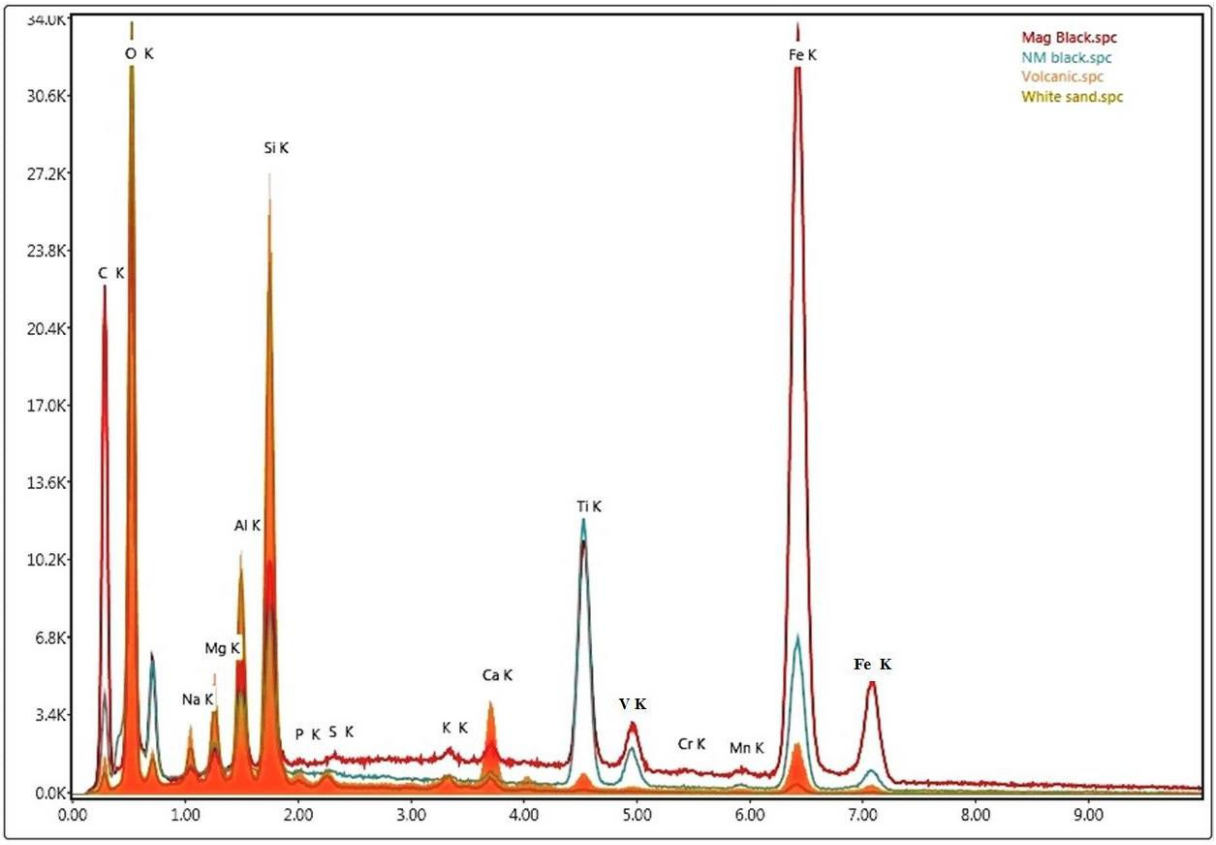

Figure S2. Elemental analysis of four sand overlay.

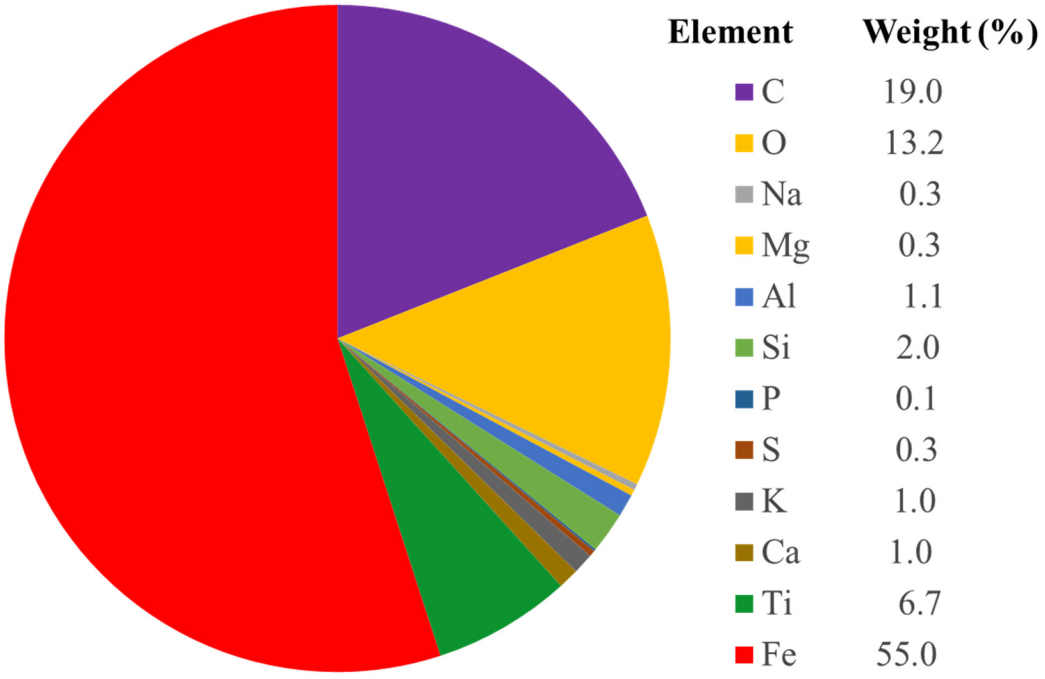

Figure S3. Elemental analysis of magnetic black sand.