

An Investigation on Atmospheric Dust Which Transport to the Persian Gulf

Ezzati, Ramin*

Assistant Professor of Biological Science, Faculty of Science, Kharazmi University, Tehran, Iran. Email: ezati2000@yahoo.com

Received Date: May 26, 2010

**Corresponding Author*

Accepted Date: June 18, 2011

© 2011 Oceanography All rights reserved.

Abstract

The Persian Gulf is under the influence of sporadic dust transportation from desert sources in North Africa (The Great Sahara) and the Middle East (Arabian Peninsula) particularly during spring and autumn. Mineral dust originated from these arid regions has characteristic of redish yellow-redish brown color due to its high iron oxide content. Following atmospheric transport, mineral dust settles by either dry or wet (washout or rainout) deposition mechanisms. Precipitation samples collected at Bandar Abbas on the North of Persian Gulf coast of Islamic Republic of Iran during the period of December 2006-December 2007 have been investigated with respect to their red dust contents. The backward air mass trajectories corresponding to the rainy days were analyzed to determine the potential source regions of red dust transported to the Persian Gulf. Approximately, 25% of the total precipitation samples can be evaluated as "red rain". The mean electrical conductivity and the volume weighted mean "Al" concentration of red rain was found to be approximately seven times and five times higher than normal rain, respectively, while the dissolution of the calcite in dust caused an order of magnitude decrease in volume weighted mean hydrogen ion concentration of red rain, by neutralizing (buffering) the acidity of rainwater. Due to the dissolution of atmospheric CO₂ in rainwater, natural precipitation is slightly acidic (pH=5.6). In this research, the volume weighted mean pH values were calculated to be 6.09 for normal rain and 7.27 for red rain. Using Al concentration of precipitation samples, wet deposition flux of mineral dust during 2007 was found to be 2.13 g m⁻² yr⁻¹. If dry deposition flux is added to this value, a total flux of 4.84 g m⁻² yr⁻¹ is found for atmospherically transported mineral dust.

Keywords: Persian Gulf, Bandar Abbas, Suspensions, Air pollution, Minerals
