

A study on chemistry of fog water over Indo-Gangetic basin

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Air pollutants get released in the atmosphere from the different sources and reaches to earth system via: dry, wet and occult deposition. Fog is an important mechanism of removal of pollutants from the atmosphere to earth surface as it scavenge the pollutants and transfer many chemical components and affects underlying surfaces like vegetation, buildings and other underlying surfaces. Indo-Gangetic basin is known for high pollution load and occurrence of fog particularly in winter seasons but less attention has been paid on chemistry of fog over this region. In this investigation measurements of chemical constituents of fog water at Agra over Indo-Gangetic basin was carried out from 2016-2018. Fog water was sampled using indigenous fog sampler. pH, electrical conductivity, Na⁺, K⁺, Ca²⁺, Mg²⁺, NH₄⁺, F⁻, Cl⁻, NO₃⁻, SO₄²⁻, water soluble organic carbon, and water soluble total nitrogen have been determined. The pH of fog water was in alkaline range. The basic fog may be due to contribution of local soil which constitutes mainly alkaline components. The concentration of NH₄⁺ was highest followed by NO₃⁻, Cl⁻, Ca²⁺, Mg²⁺, K⁺, Na⁺, F⁻. The high concentration of ammonium may be due to high concentration in soil and nearby dairy. The other dominant sources of pollutants were cow dung cake burning, increase in combustion of coal for cooking and heating purposes over this region. Ammonium was found to be major neutralizing agents, The air mass trajectory study reveals the role of long range transport to fog water. The annual input of sulphur and nitrogen components by fog water have been determined and found to be relatively higher than rainwater over this region.