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Air pollution impact assessment in the area surrounding the industrial settlement of Priolo/Augusta (Italy): A multidisciplinary approach.

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Exposure: [ambient air pollution \(http://ehp.niehs.nih.gov/isee/tag/ambient-air-pollution/\)](http://ehp.niehs.nih.gov/isee/tag/ambient-air-pollution/)

Background. During the past years air pollution impact on environment and health in areas surrounding industrial sites has received an increasing attention in order to prevent or minimize adverse effects or clean-up compromised ecosystems. The measurement of pollutants emissions into the environment by chemical analysis provide little information on the toxicological activity of the contaminants. Biological monitoring assesses the effects of air mixtures on reactive organisms, highlighting the interactions among individual compounds. Exposure to air pollutants causes adverse effects both on environment, agriculture and human health. Aim. In order to evaluate the impact of atmospheric pollutants emitted by the industrial settlement of Priolo/Augusta (Italy) heavy metals (Pb, Cd, As, V, Hg, Rh, Pd, Pt, Ni) levels in air were monitored in the year 2010 and *Vibrio fischeri* test was used to appraise airborne pollutant ecotoxicity. Method. Sampling and determination of heavy metals was performed according to UNI EN 14902. From filters it was made an aqueous suspensions and measured the ecotoxicity (EC50 values) of samples. Statistical analysis is made by R software. The inhibition levels and effective toxicity concentrations of these samples and solutions were determined. Interactive toxicity effects among the metals were investigated. Results. Pb, Cd, As and Ni were found in trace amounts but always below law limits 155/2010. Hg, Rh, Pd and Pt were always below the detection limit. The impacts of the single heavy metal solutions were compared with each other, a toxicity ranking of Cd>Pb>As>V>Ni was obtained in order of decreasing severity. The total effective concentrations of these five metals were in the ranges of 0.094–0.543 µg/mc. The interactive toxicity effects of the heavy metals in samples were classified as antagonistic. Conclusion. High levels of heavy metals may constitute an important input in the biochemical cycle and may have significant impacts, but our findings are not considered concern for human health.

