

HEALTH RISKS OF HEAVY METALS FROM AIR POLLUTION IN ALBANIA

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Abstract

The most toxic heavy metals, cadmium, lead and mercury in air are mainly emitted as a result of various industrial activities, traffic emission and waste incineration. Even in low concentration, heavy metals accumulate in the soil and enter the food chain of certain animals by causing different disorders. On other hand, heavy metals are persistent in the environment and are subject to bioaccumulation in food-chains. Because of the persistence and potential of heavy metals for global atmospheric transfer, atmospheric emissions affect even at the most remote regions. This study is focused on the sources, chemical properties and spatial distribution of environmental pollution with cadmium, lead and mercury caused by different emission sources in Albania and evaluates the health in the most polluted areas.

The atmospheric deposition of Cd, Pb and As in Albania was investigated by using carpet-forming moss species (*Hypnum cupressiforme*) as bioindicators. This research is a part of the international program (International Cooperative Programme (ICP) Vegetation, UNECE) carried out in most European countries since 1987, investigating the impacts of air pollutants on crops and natural vegetation. Sampling was carried out during the dry seasons of autumn 2010 and summer 2011 at 44 sites distributed all over Albania.

Inductively Coupled Plasma Atomic Emission Spectroscopy (ICP-AES) analysis made it possible to determine concentrations of 19 elements including key toxic metals such as Pb, Cd, As, and Cu. Data were processed by using the MINTAB 15 software package.

The median values of the elements in moss samples of Albania were high for Al, Cr, Ni, Fe, and V and low for Cd, Cu, and Zn compared to other European countries, but generally were of a similar level as some of the neighboring countries.

This study was conducted in order to produce information needed for better identification of contamination sources and improving the potential for assessing environmental and health risks in Albania, associated with toxic metals. The Elbasan Metallurgical Combine and mining industry are the main contributors of iron, chromium, nickel, and vanadium in Albania. The pollution emitted from the Elbasan Metallurgical Combine has caused serious pollution on the Shkumbini River, many problems to the microenvironment, and adverse effects on the human health, especially in pregnant and lactating mothers. The prevalence and severity of respiratory allergic diseases such as bronchial asthma have been increased in recent years among the people of this area.

Key words: Heavy metals, Air pollution, Bioindicator, Mosses.