Increasing health risks by heavy metals through use of Vegetables and Crops

Adnan Hussain

University of the Punjab Lahore, Pakistan

Abstract

Heavy metal is a problem word described in various ways by a variety of authoritative bodies. The word is also applied to metals that are poisonous. The concept was first used by Bjerrum in 1936. Heavy metals are now increasingly a global concern. It directly or indirectly influenced the agricultural system. We face very severe health issues because of this. Pakistan faces this question, too, since many countries throughout the world lack clean water. Swage and industrial water are rich in nutrients. It is because farmers use this toxic wastewater in order to produce greater yields for irrigation purposes. Farmers use these types of water in urban areas in Pakistan to increase irrigation health risks.

Tiny and non-essential heavy metals can be of two forms. Micronutrients are known as elements such as zinc, copper and manganese. For living organisms, these are important. The majority of enzyme functions are performed by these elements. Some are required in small amounts in the body. The body does not play a role for metals such as cadmium and lead, so called non-essential elements. They exist in large amounts, most of which are more than 5 grams cm-3. Arsenic is a metalloid in the heavy metals group due to similarities in its chemical properties and environmental behavior. Heavy metals are a very diverse group of elements in their biological properties and functions. They are very heterogeneous. The adverse effects of heavy metals on plants, animals and humans are held under the umbrella of environmental contaminants. Both anthropogenic and natural activities cause heavy metal pollution of soil. Locally, the level of heavy metals such as Cd, Co , Cr, Pb, As and Ni in soil have been raised to dangerous levels by anthropic activity such as mining , smelting and farming. By fact, heavy metals continue to build up by soils and plants. So, the physiology of plants such as photosynthesis, gas exchange, and nutrient uptake is interfered with by heavy metals and reduces plant growth, dry matter accumulation and yield.

The toxicity of metals increases by pollution of field water, the overuse of fertilizer and the use of insecticides , pesticides, fungicides and herbicides in metals. The increased heavy metals in the atmosphere are also induced by agricultural practices, wastewater drainage, transport, vehicle exhausts, solid waste disposal and application of sludge. It was found that heavy metals taken up by the plants are vegetables grown in this type of waste water. Water and irrigated soil produce more metals. Plants produced in polluted soil and water has higher levels of metal deposition than non-contaminated soil (Sharma et al. 2009). The remains of these metals are smaller in plants and seed parts and are ingested by people causing health issues across the food chain. The quality of irrigated water both short- and long-term, is significantly affected by untreated waste from commercial, domestic and storm water, agricultural runoffeness and other sources.

The production of batteries is one of the main sources of heavy metals which, even at low levels, pose serious harm to human health. Wastewater is a very common method of irrigation, primarily because of the limited freshwater supplies in developing countries. Through wastewater, poisonous metals pose significant hazards for soil, plants and vegetables and also human health. The study aims at assessing the level of metal pollution in untreated wastewater-irrigated soil and vegetables. One of the key forms in which these elements enter the human body is by ingesting foods that contain heavy metals. Heavy metals are placed centrally in fatty bone tissues, which cover noble minerals. Heavy metals can cause a variety of diseases gradually being released into the body.

The consumption by crops and vegetables of heavy metals is determined by the presence of soil metals, the accumulation capacity of vegetable component metal I. In 2006 Intawongse and Dean used the GI system to test metals such as Zn , Mn and Cd for bio-availability. Ingestion by crops or vegetables with pollutants and heavy metals may cause death or fatal illness. Cd intake can cause kidney disease. Pb causes kidney problems and also affects cardiovascular and nervous systems. Heavy metals are toxic to the environment; some have carcinogenic properties like Ar, Cr, and Cd. Ingestion of these substances can cause deadly health problems with their limited quantity. Since heavy metals have these fatal effects on humans, they should be definitely treated or removed. These metals can in many ways be removed. This is the most effective way to use bio-absorbents. The absorption of heavy metals by bacteria is also important for water solution removal. In addition, phytoremediation was implemented worldwide in the war against heavy metals.

The role of vegetables in the maintenance of physiological conditions is significant in human diets. The agricultural items are polluted due to anthropogenic activities and emissions. The study was carried out in the Chunian-Jamber sector, Kasur district, to evaluate the amount of heavy metals in plants irrigated with wastewater. Comparison was made of heavy metals in soil, water and vegetables from the study region such as zinc, lead and chromium. Each town was selected to carry out the experiment in four locations and 10 plants e.g. potato, radish, carrot, fenugreek, Spinach, Tomato , Onion, Turnip, Cauliflower, Pangalo. The vegetables were irrigated using industrial wastes and atomic absorption spectrophotometer (AAS) was used to measure the concentration of heavy metals. It was concluded that heavy metals in irrigated water because of industrial waste were above the FAO boundaries. In Jamber and Chunian, Zn and Pb were high, and the water level was significantly higher than the FAO safe limits in the entire sample of water, just in the water sample at one Jamber site. Zinc rates in soil were higher than plum and chromium in soil samples. Zn and Pb were identified as priority pollutants in study area vegetables but these concentrations were within FAO safe limits. In order to avoid contamination in the food chain and thereby reduce human health hazards, it is advisable to continuous inspecting heavy metals.