

Heavy Metals Contamination in the Crops of Industrialized Areas of the Punjab Province of Pakistan

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Abstract

Punjab being the province of five rivers is considered to be a fertile land. This work is related to the determination of heavy metals (mg/g of dry mass of the crops) in the major crops (wheat, rice, corn, spinach and ladyfinger) of the three (Faisalabad, Shaikhupura and Shakargarh) fertile but industrialized regions of the province. Because of the lack of a proper waste management there has always been a risk of impurification of the irrigation water with hazardous substances. The aim of this work was to check the effect of the industrial effluents on the major crops of the area and the resulting contamination. During the analyses, Hg, Pb and Ni were found to be below the detection limit for all the samples, whereas Cr, Cd, Cu, Mn and Zn were found in considerable amounts. It was observed that spinach was the most vulnerable to heavy metals contamination among the analyzed crops. Results showed that crops from Sheikhupura region contained more heavy elements, like Cr (up to a maximum of 0.410 mg/g of spinach), Cd (up to 0.024 mg/g of spinach), Cu (up to 0.074 mg/g of spinach), Mn (up to 0.153 mg/g of spinach) and Zn (up to 0.134 mg/g of ladyfinger) than Faisalabad and Shakargarh. Except few exceptions, most of the samples from the three sampling zones contained the toxic elements in a quantity more than the permissible limits of WHO/EU [1, 2], threatening the health of consumers.

[1] Abdullahi, M.S. Uzairu, A. and Okunola, O.J. Quantitative determination of heavy metal concentrations in onion leaves. *Int. J. Environ. Res.* Vol 3(2). 271-271 (2009).

[2] WHO/EU (1993). WHO and EU Drinking water Quality Guidelines for heavy metals and threshold values leading to crop damage.