



Qualitative relation between heavy metal concentration in soil and agricultural products: a Chinese peri-urban case study

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A peri-urban area refers to a transition or interaction zone, where urban and rural activities are juxtaposed, and landscape features are subject to rapid modifications, mainly due to human activities. It is reported that peri-urban areas which might include valuable protected areas (e.g. forested hills, preserved woodlands, prime agricultural lands, etc.) can provide essential life support services for urban residents. A peri-urban area is not only a zone experiencing the immediate impacts of land demands from urban growth and pollution, but it is also a wider market-related zone of influence, recognized for the supply of agricultural and natural resource products. It is reported that China's environmental crisis is one of the most pressing challenges to emerge from the country's rapid industrialization; therefore a field study was carried out to investigate the qualitative relation of soil property with vegetable agricultural products in the Chinese peri-urban area located in Luoyang city (34°37'N and 112°27'E). Soil, water and plant (e.g. squash, *Cucurbita maxima*) samples were taken over the study site, and heavy metal concentrations were analyzed. All the soil samples showed Cd concentrations exceeded the permissible level established by Chinese guidelines for soil quality (0.3 mg/kg). The contents of Zn, Pb and Cu also surpassed the Chinese guideline levels (Zn = 250 mg/kg, Pb = 50 mg/kg and Cu = 100 mg/kg) in several soil samples. Although the sampled plants contained some degree of all the heavy metals, only the Al concentration was high in the *Cucurbita maxima* samples (317 mg/kg), which is a specie of cultivated squash. Considering the world market and the global trade of agricultural products, it can be said that the food risk associated with farm products containing Al is not local but global. It is concluded that an environmental contamination of the peri-urban areas may lead to the threat to food security.