



Risk assessment of human health for geogenic chromium and nickel in soils derived from serpentines

Zeng-Yei Hseu (1) and Yun-Jie Lai (2)

(1) Department of Agricultural Chemistry, National Taiwan University, Taipei, Taiwan (zyhseu@ntu.edu.tw), (2) Apollo Technology Co., LTD, Taipei, Taiwan (yjlai@apollotech.com.tw)

Concentrations of Cr and Ni are extremely high in serpentine soils compared to soils from the other parent materials. Three serpentine sites in Taiwan were selected to determine health risk of Cr and Ni as cumulative carcinogenic and non-carcinogenic risks via the multiple routes of ingestion, dermal contact, inhalation, and diet on adults and children. The mean levels of Cr and Ni were higher than the soil control standards of heavy metals in Taiwan (250 and 200 mg/kg of Cr and Ni). For adults and children, the total dose of chronic daily intake (mg/kg/d) was the highest for Ni, followed in descending order by Cr(III) and Cr(VI) at all sites. Regardless inhabitant age, the total carcinogenic risk was much lower than $1.0E-6$. However, the hazard index (HI) of non-carcinogenic risk exceeded 1.0 for adults at all sites, which was mainly contributed in Ni by eating rice.