Environmental Arsenic Exposure of Schoolchildren in a Former Tin Mining and Smelting Community of Southern Thailand

Banjong Vitayavirasak*, Kittiya Rakwong and Warangkana Chatchawej

Faculty of Environmental Management, Prince of Songkla University, Hat Yai, Songkhla 90112, Thailand

(Received September 17, 2004; accepted May 23, 2005)

Key words: arsenic exposure, environmental monitoring, biological monitoring, cancer risk

Risk behavior and environmental sources of exposure to arsenic for 10-year-old schoolchildren were studied in a high exposure area and a low exposure area of Ron Phibun Subdistrict, Ron Phibun District, Nakhon Si Thammarat Province and compared to those in a control area. Arsenic concentrations of surface soil, ambient air and drinking water to which subjects in the high exposure group, the low exposure group and the control group were exposed, were significantly different ($p < 0.05$). Similarly, urinary concentrations of total arsenic and the sum of inorganic arsenic and its metabolites were significantly higher in the study groups than the control group. The arsenic content of locally grown agricultural produce was small with the exception of freshwater snails (*Sinotaia ingallsiana*). Drinking water and surface soil were found to be the main sources of exposure. The exposure was mediated by the subjects’ risk behavior, such as playing with soil and no hand-washing before eating. The estimated cancer risk from arsenic for the schoolchildren in the study area was between $10^{-5}$–$10^{-6}$ which meant that their risk of developing cancer was probable. Measures to reduce the cancer risk are recommended.

*E-mail: banjong.v@psu.ac.th*