# Health risk of Cadmium: A hidden health killer in areas of coal-combustion related fluorosis?

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Coal-combustion related chronic fluorine toxication, a specific endemic disease occurred in China, has been causing serious health problems with teeth and bone damages in the Three Gorges region, China, which was attributed for the intake of elevated levels of fluoride emitted through domestic combustion of high fluorine coal, often without stoves or chimneys in the house. However, recent epidemical study found that the fluorosis in the coal-combustion related endemic disease areas in Three Gorges region was not significantly alleviated, but in some specific areas, the number of population with symptom of fluorosis, i.e. teeth and bone problems, showed increasing tendency. Our recent study found that the endemic disease areas showed high cadmium (Cd) concentrations in the environment and in the urine and hair substrates of the local population. We determined high concentrations of Cd in the local black shales (77.3-212.2 ppm), domestic coals (11.5-54.5 ppm) and arable soils (1.07-59.7 ppm), showing obvious geochemical anomaly. The high Cd in the local environment also contributed to high Cd in the local human substrates, i.e. 6.73 ppm in hair and 5.1 μg/L in urine on average.

The studies for toxicological effects of F and Cd on human demonstrated that the patients suffered from F and Cd toxication had similar clinical symptom, such as yellow macula on teeth and body bone damages, although the symptoms occurred different extents each other due to diverse exposures and nutritional conditions. Therefore, we hypothesized that Cd is a hidden health killer to affect the local endemic disease of the coal-combustion related fluorosis. Our hypothesis was supported by the recent epidemical finding (2003-2007) that the fluorosis in the coal-combustion related endemic disease areas in Three Gorges region was not significantly alleviated but the size of epidemical areas tended to be more overspreading. Therefore, it is significant to further understand and pinpoint the health risk for a better prevention of the local endemic disease.

# Zircon SHRIMP U-Pb dating of Echeng granite in the southeastern Hubei, MLYB, Eastern China

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The MLYRB represents one of the most important economic mineral districts in China [1]. Late Mesozoic granitoids occupy approximately 17% of the area in the southeastern Hubei, in which the granites originated from somewhat deeper source than that porphyry quartz diorite and monzonite intrusions, and were dominantly emplaced in a lithospheric thinning tectonic regime [2]. The timing of these granites has not been well constrained and we present new Zircon SHRIMP U-Pb age for Echeng granite to constrain the timing of these granites.

The Echeng granitoid intruded a Late Triassic, intercalated sandstone-carbonate sequence and consists predominantly of granitic, and subordinate quartz diorite and monzonite phases. The granites are composed of K-feldspar (45 ~ 55%), plagioclase (13 ~ 18%), quartz (30 ~ 35%) and rare biotite, as well as accessory minerals such as zircon, titanite, magnetite and apatite. Sample preparation and the detailed analytical procedure were undertaken on SHRIMP II at the Beijing Ion Probe Center, CAGS.

The $^{206}Pb/^{238}U$ apparent ages of 16 zircon grains in this study range between 105.6± 6.4 Ma and 136.8± 3.6 Ma. Apart from the exception of two spots, the apparent ages of the other 14 spots are plotted with the inverse $^{238}U/^{206}Pb$ - $^{207}Pb/^{206}Pb$ U-Pb concordia diagram, and the weight average $^{206}Pb/^{238}U$ age of 121.2 ± 3.1Ma was acquired. This result indicates that the Echeng granite emplaced during the Cretaceous period.

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