# Characteristic elements and lead isotope of Kaempferia Galangal from Yangchun, Guangdong, China

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Products of designations of origin was used to describe a product originating in that specific place, region, or country, if the quality or characteristics of which were essentially or exclusively due to a particular elements geochemical factors, and the production, processing and preparation of which took place in the defined specific place, region, or country [1-3].

Select products of designations of origin Kaempferia Galangal from YangChun, Guangdong Province, China. The plants and soil profile samples were collected and the element content, element speciation, and lead isotope ratio were determined. Through the multivariate statistical analysis to ascertain the characteristic elements and multielement group, and provide evidence for establishing the elements- isotope fingerprints of product identification system. Fourteen trace elements in soil and galangal samples were measured to explore the feasibility of characteristic elements as the fingerprinting marker of products of origin. The results showed that there was a significant correlation between the contents of trace elements in soil and galangal. Trace elements yield a good inheritance between soil and galangal. Mg, Mn, Zn, Sb, Fe, Cu and Sr were the characteristic elements of Galangal by weight analysis. The geochemical tracer method could be used in research the effect of regional geochemical background on the products of origin.

Lead isotope ratios analysis result showed that the sources of lead in the soil profile and Galangal was very stable, lead isotope ratios of Galangal was very close to the distribution characteristics of soil region. $^{206}Pb/^{208}Pb$ -$^{206}Pb/^{207}Pb$ showed significant correlation further proves the product with soil were homology. Lead isotope could be used as the criterion of fingerprint identification of products of designations of origin.

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# Weathering fluxes from time series sampling of the Irrawaddy and Salween Rivers

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The Irrawaddy and Salween rivers in Myanmar Burma have water fluxes ~70% of the Ganges-Brahmaputra river system. Together these systems are thought to deliver about half the dissolved load from the tectonically active Himalayan-Tibetan orogen [1]. Previously very little data was available on the dissolved load and isotopic compositions of these rivers.

Here we present time series data of 171 samples collected fortnightly at intervals throughout 2005 to 2007 from the Irrawaddy and Salween at locations near the river mouths, the Irrawaddy at Myitkyina, the Chindwin, a major tributary of the Irrawaddy and a set of 28 small tributaries which rise in the flood plain of the Irrawaddy between Yangon and Mandalay. The samples have been analysed for major cation, anion, Sr and $^{87}Sr/^{86}Sr$ ratios. The new data indicates that the Irrawaddy has an average Na concentration only a third of the widely quoted single published analysis [2].

The catchment of the Salween extends across the Shan Plateau in Myanmar through the Eastern syntaxis of the Himalayas and into Tibet. The Irrawaddy flows over the Cretaceous and Tertiary magmatic and metamorphic rocks exposed along the western margin of the Shan Plateau and the Cretaceous to Neogene Indo-Burma ranges. The chemistry of the waters reflects these differences with the $^{87}Sr/^{86}Sr$ compositions of the Salween and Upper Irrawaddy (between 0.713 and 0.718) significantly higher than the downstream Irrawaddy (0.709 to 0.711) and the Chindwin (0.708 to 0.710). The Irrawaddy and the Chindwin exhibit lower $^{87}Sr/^{86}Sr$ and Na/Ca ratios during and immediately post-monsoon, interpreted to reflect higher weathering of carbonate at high flow (c.f. [3]). The Salween exhibits higher $^{87}Sr/^{86}Sr$ ratios but lower Na/Ca ratios during the monsoon, interpreted to reflect higher inputs from the upper parts of the catchment in the Himalayas.

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