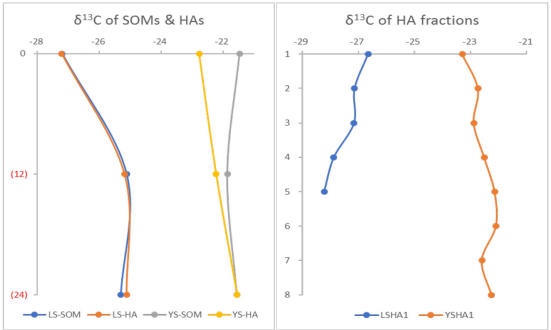
Implication of $\delta^{13}C$ variations in two soil profiles of the southwest China karst area

X. XIA[1], Q. LI[1], X. DI[1] AND B. XIAO[1*]

[1]State Key Laboratory of Environmental Geochemistry, Institute of Geochemistry, Chinese Academy of Science, Guiyang 550081, China (*: xiaobaohua@vip.skleg.cn)

The limestone soil and the yellow soil are of two most common seen soils in the southwest China Karst area, they may present in adjacent areas of similar climatic and geographical conditions, previous studies observed that contents and distributions of soil organic matters (SOMs) along vertical profiles and behaviors under artifical disturbences of the two soils were usually notably different. The underlying mechanisms causing the difference remain elusive.

We collected soil profile samples from a limestone soil site and a yellow soil site, both of which were covered by nature vegatation, extracted humic acids (HAs) from soil samples, and fractionated bulk HAs by ultrafiltration to obtain HA-fractions of different molecular size. The $\delta^{13}C$ of SOMs, bulk HAs and HA-fraction samples (HAFs) were measured and discussed integratedly with other characteristic data, e.g. elemental compositions, chemical function groups compositions and molecular sizes of HAs, to exam the $\delta^{13}C$ information for the source and evolution of SOMs in two soil profiles. The results indicated that the variations of $\delta^{13}C$ in SOMs and HAs of the two soil profiles were significantly different, and $\delta^{13}C$ of HAs fractions isolated from the bulk HAs of top soils showed even opposite trends (as Figure).



It is very complicated to thoroughly understand the information of $\delta^{13}C$ in SOMs and its components of soils, we believed the different variations of $\delta^{13}C$ along two soil profiles implied sources and evolution characteristics of SOMs.