# Water geochemistry of the Yalong River region of eastern Tibetan Plateau

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The Yalong River, one of the largest tributaries of the Yangtze River, drains a large portion of eastern Tibetan Plateau which is the highest and most tectonically active region in the world. The chemical and strontium isotopic compositions of the river waters are measured to obtain the knowledge of chemical weathering progress and their controlled factors. Results show that rock weathering contributes about 90% of the total cations and carbonate weathering plays a most important role. The major ion compositions of river waters are characterized by the dominance of $Ca^{2+}$ and $HCO_3^-$, with an extremely low $F^-$ and $NO3^-$ concentrations that indicating the negligible anthropogenic inputs. The chemical and Sr isotopic analyses indicate that three major weathering sources (dolomite, limestone, and silicates) contribute to the total dissolved loads, which is similar to the river waters draining karst-dominated terrain. However, the waters of Yalong River have a relatively lower $Sr^{2+}$ concentrations and higher $^{87}Sr/^{86}Sr$ ratios (0.7077–0.7198) compared with the karst-dominated river basins.

This study show that runoff and PER (physical erosion rate) have a positive correlation with the carbonate and silicate chemical weathering rates of the Yalong River. The chemical weathering rates of this area are 9.3 and 44.3 ton $km^{-2}$ yr- by silicate and carbonate weathering respectively, which is similar to the other main rivers draining the eastern Tibetan Plateau and twice higher than the world average value. The total $CO_2$ consumption flux by chemical weathering in this area is $92.2\times10^9$ mol/yr, which account for more than 0.4% of the total global $CO_2$ consumption.