Geophysical Research Abstracts
Vol. 19, EGU2017-3413, 2017
EGU General Assembly 2017

Dietary shift after 3600 cal yr BP and its influencing factors in northwestern China: Evidence from stable isotopes

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Abstract:Human diets rely on natural resource availability and can reflect social and cultural values. When environments, societies, and cultures change, diets may also shift. This study traced the extent of dietary change and the factors influencing such change. Through stable carbon and nitrogen isotopic analysis of late Neolithic and early Bronze Age human and animal bone collagen, we found that significant shifts in human diets were closely associated with intercontinental cultural exchanges in Eurasia and climate change in northwestern China. The isotopic evidence indicated that human diets mainly consisted of C4 foodstuffs (presumably millet and/or animals fed with C4 foods) around 4000 calibrated years before the present (cal yr BP), corresponding to the flourishing of millet agriculture in the context of the optimal climate conditions of the mid-Holocene. Subsequently, more C3 foods (probably wheat, barley, and animals fed with C3 foods) were added to human diets post-3600 cal yr BP when the climate became cooler and drier. Such dietary variation is also consistent with the increasing intensity of long-distance exchange after 4000 cal yr BP. While many factors can lead to human dietary shifts (e.g. climate change, population growth, cultural factors, and human migration), climate may have been a key factor in Gansu and Qinghai.