Wadi as collectors of drinking water in South Mongolia

DAVID JUŘIČKA[1], MAJIGSUREN YONDON[2], JITKA NOVOTNÁ[1] AND JINŘICH KYNICKÝ[1]

[1]Mendel University in Brno, 613 00 Brno, Czech Republic (25389@node.mendelu.cz)
[2]University of Science and Technology, Ulaanbaatal 46, Mongolia (majigsuren@yahoo.com)

Current drinking water resources of south Mongolia do not yield suitable quality and quantity to often. Solution of the drinking water deficit issue can partially solve the large wadi evaluation, such as drinking water collectors. We constructed the first evaluation of wadi water capacity for Khan Bogd complex, which is one of the largest known intrusions of peralkaline granite (*ca*. 1500 km^2). Watersheds and stream network and profiles carefully identified in the field were verified by comparison of supervised classifications of Landsat TM images. The possible sources yield almost 5.0×10^6 m^3 and average annual recharge rate for the Khan Bogd wadi aquifers is estimated at 1.892×10^6 m^3. The only risk of the aquifer contamination presents stock, but comparing the chemical composition of the water from wells used for animals feeding and samples of groundwater, we didn't observe any important contamination (ammonium up to 10 mg/l). Present study is the first attempt to describe and evaluate the potential wadi Khan Bogd as a source of drinking water in the Mongolia. Implication for use of this new water source accessible for drinking water in whole arid region of South Mongolia is clear.

Distinguishing mantle derived contributions at a continental arc volcano: Tatara-San Pedro

J. JWEDA[1], S.L. GOLDSTEIN[1], M.A. DUNGAN[2], C.H. LANGMUIR[3] AND J.P. DAVIDSON[4]

[1]Lamont-Doherty Earth Observatory, Columbia Univ., 61 Rt. 9W, Palisades, NY 10964, USA (*correspondence: jjweda@ldeo.columbia.edu)
[2]Université de Genéve, 13 rue des Maraîchers, CH-1205, Geneva, Switzerland
[3]Harvard University, 20 Oxford Street, Cambridge, MA 02138, USA
[4]University of Durham, South Road, Durham DH1 3LE, UK

Subduction recycling plays a key role in the distribution of elements between the mantle and crust. One of the important challenges in the study of arc magma genesis is identifing contributions from the subducted slab and mantle, and distinguishing them from crustal contamination at relatively thick crust continental arc volcanoes [1, 2]. The Quaternary Tatara-San Pedro complex (TSPC) of the Southern Volcanic Zone (SVZ) is a large, compositionally diverse frontal arc volcanic complex. High-density sampling has yielded one of the most complete eruptive chrono-stratigraphies (spanning over 930 kyr) of any arc volcano [3, 4, 5]. This provides us with a unique opportunity to elucidate magma source heterogeneity and the effects of recycled slab, mantle, and crustal input at a continental arc volcano.

This study augments an extensive XRF geochemical dataset with new isotope and ICP trace element analyses. Although most TSPC lavas appear impacted by crustal input, we distinguish three distinct mantle-derived magma types: (1) one derived from 'depleted mantle' fluxed by slab-derived hydrous fluids (high Sr/Nd, Zr/Nb and low $^{87}Sr/^{86}Sr$), (2) one from 'enriched mantle' (high incompatible elements, HFSE, and $^{87}Sr/^{86}Sr$), and (3) another that appears prevalent to the SVZ mantle wedge (subduction modified) with generally intermediate but still distinct chemistry (broadly similar to parental magmas at other SVZ volcanoes). Extensive MASH processing is precluded by the absence of significant garnet fractionation in the endmembers and by eruption of diverse parental magmas over short time intervals.

[1] Hilldreth & Moorbath (1988) *Contrib Mineral Petrol* **98**, 455–489. [2] Davidson *et al*. (1988) *Contrib Mineral Petrol* **100**, 429–445. [3] Fergueson *et al*. (1992) *J Petrol* **33**, 1–43. [4] Singer *et al*. (1997) *Geo Soc Am Bull* **109**, 127–142. [5] Dungan *et al*. (2001) *J Petrol* **42**, 555–626.