Structural and geochemical evidence for the origin of felsic microgranular enclaves and porphyry granite, Itu Rapakivi Batholith, SE Brazil

VALDECIR DE ASSIS JANASI[1], GIOVANNA DOS SANTOS PEREIRA[1] AND ADRIANA ALVES[1]

[1]Instituto de Geociências, Universidade de São Paulo, Rua do Lago, 562, 05508-080, São Paulo, Brazil, vajanasi@usp.br (corresponding author); gsp.santos@gmail.com; adrianaalves@usp.br.

The 590 Ma Salto Granite Pluton, part of the post-orogenic Itu Rapakivi Batholith (590-580 Ma), SE Brazil, is interpreted on the basis of structural data as a westward-tilted magma chamber, whose main portion consisting of red coarse-grained hornblende-biotite granite is capped by a cupola of pink inequigranular biotite leucogranite with miarolitic cavities. This main unit was invaded by a body of zoned rapakivi granite which varies from a porphyritic facies dominated by fine-grained matrix (porphyry granite) to a cumulate granite in the eastern deeper portions. Abundant felsic microgranular enclaves (*fme*) with ellipsoidal shape and dimensions up to 4 m occur within both the red granite and the rapakivi granite, and are interpreted as products of recharge by new inputs of slightly hotter magma that broke up and froze within mushy portions of the chamber in advanced state of crystallization.

Whole-rock geochemistry helps recognize the identity of the three main magma pulses that constituted the pluton. Relative to the main body, the porphyry-rapakivi granite unit is on average slightly less felsic (0.3-0.4 wt% MgO), and has higher Ca, Ba and Sr. The *fme*, on the other hand, besides being distinctly less felsic (0.4-0.7 wt% MgO), are characterized by higher Rb and U, and lower Sr/Ba, Ba/Rb and Th/U. REE patterns ($(La/Yb)_N$= 14-18), ($^{87}Sr/^{86}Sr)_t$ (0.7058-0.7074) and εNd_t (-10.0 to -10.6) do not discriminate the units, revealing the broadly cogenetic nature of all magma inputs. Very small (<3 cm) mafic microgranular enclaves (2.3-2.9 wt% MgO) had their chemical composition strongly transformed by reaction with the host granite magmas; although they are indicative that basic magmas participated in the genesis of the granites making up the pluton, these probably did not reach the exposed portions of the Salto chamber.

Financed by Fapesp, Grants 07/00635-5 and 2012/04148-0 and Ms Scholarship (2010/03300-7; to GSP)

Change in water circulation of the Bering Sea recorded by authigenic neodymium isotopes in sediments from the Bering Slope over 500 ka BP

KWANGCHUL JANG[1*] AND YOUNGSOOK HUH[1]

[1]School of Earth and Environmental Sciences, Seoul National University, Seoul 151-747, Korea, wkdrhkd3@snu.ac.kr (*presenting author), yhuh@snu.ac.kr

The Bering Sea is located in the nothernmost part of the Pacific Ocean, joining with the Arctic Ocean. Because of its proximity to the polar region which is sensitive to climate change, reconstructing the paleoenvironmental changes of this region is important. We analyzed the neodymmium isotope ratios in Fe-Mn oxide coating of marine sediments from the Bering Slope (site U1345; water depth 1008 m) recovered during the Integrated Ocean Drilling Project (IODP) Expedition 323. The ε_{Nd} value (n = 80) for the last 150 kyrs was relatively constant at an average value of -3.0 ± 0.8, which is slightly higher than the values of the Bering Strait (-4 to -6) [1]. We observed some deviations from the average ε_{Nd} value. According to the tentative age model [2], trends toward unradiogenic value were observed during deglacial periods. The Yukon River whose pathway was blocked by sea ice during cold periods may have increased its input of unradiogenic material to the Bering Sea upon melting of sea ice during deglacial periods. Seasonal sea ice and brine formation may have facilitated the sinking of this unradiogenic water mass. A radiogenic ε_{Nd} peak was observed in MIS 4. It may be interpreted as enhanced sinking of the Kamchatka-sourced radiogenic water as suggested by Horikawa *et al*. [2010].

[1] Dahlqvist *et al*. (2007) *Geochim. Cosmochim. Acta* 71, A196. [2] Takahashi *et al*. (2011) *Proc. IODP, 323*: Tokyo, doi:10.2204/iodp.proc.323.109.2011. [3] Horikawa *et al*. (2010) *Geology* **38**, 435-438.

DOI:10.1180/minmag.2013.077.5.10