## 5.5.P20

# Paleozoic magmatism in the northeastern margin of the Argun terrane (Upper Amur Region): Timing and tectonic implications

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A series of gabbro-diorite-granodiorite-granite bodies extends for several hundred km along the margin of the Argun terrane and are associated with oceanic paleocrust in the Mongolian-Okhotsk belt. Until recently, these intrusions have remained practically unstudied in spite of the fact that they are of paramount importance for understanding oceanic crustal processes and formation of the fold belt.

U-Pb geochronology has revealed at least three age groups that were formed in different geodynamic settings. The oldest age (467 ± 5 Ma) was obtained for a subalkaline leucogranite that forms small tectonic blocks among Paleozoic terrigenous deposits. Geochemical features [Rb 128 ppm, Ba 557 ppm, Th 33.7 ppm, La 49.13 ppm, Yb 6.90 ppm, Y 70 ppm, Ta 1.44 ppm, Nb 23 ppm, $^{87}Sr/^{86}Sr(t)$ 0.71139, $\varepsilon_{Nd}(t)$ +2.4] indicate that these leucogranites are A-type. The presence of Cambrian terrigene-carbonaceous deposits in the Argun terrane suggests that this stage of granitoid magmatism was related to passive margin evolution of a protocontinent (probably eastern Gondwanaland).

The next stage of granitoids were emplaced at ~380 Ma – two U-Pb ages available are 386 ± 10 Ma and 371 ± 5.5 Ma. Geochemical composition of these granitoids [Rb 105 ppm, Ba 682 ppm, Th 5.37 ppm, La 12.77 ppm, Yb 0.91 ppm, Y 8.40 ppm, $^{87}Sr/^{86}Sr(t)$ 0.70409, $\varepsilon_{Nd}(t)$ -0.4] corresponds to I-type. We relate their formation to the onset of subduction of the Mongolian-Okhotsk oceanic crust under the Argun terrane.

The youngest U-Pb ages have been obtained for a gabbro (274 ± 6 Ma), quartz-diorite (276 ± 8 Ma) and granodiorite-granite (278 ± 7 Ma) that are found as numerous bodies along the southern rim of the Mongolian-Okhotsk belt. Geochemically, these granitoids are also I-type [Rb 20-100 ppm, Ba 319-585 ppm, Th 1.7-6.2 ppm, La 13.5-17.2 ppm, Yb 1.3-2.4 ppm, Y 14-25 ppm, Ta 0.3-0.9 ppm, Nb 3.6-4.5 ppm, $^{87}Sr/^{86}Sr(t)$ 0.70537–0.70724, $\varepsilon_{Nd}(t)$ +0.8, +2.2]. They were formed within a late Paleozoic magmatic arc that involved subduction of oceanic crust under the Argun terrane.

## 5.5.P21

# Archaean granites at Serrinha Nucleus, Bahia, Brazil

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The Serrinha Nucleus (SerN) forms an ellipsoidal structure (> 21.000 km$^2$) in the northeastern portion of Bahia State. This gneissic-migmatitic Archaean nucleus of the São Francisco Craton (SFC) is covered by volcano-sedimentary sequences and has been intruded by a wide range of granites. In the Archaean, an important crust-producing episode resulted in the emplacement of diverse 3.1 to 2.8 Ga granitic plutons. These intruded an older crust, whose presence is indicated by 3.6 Ga zircon xenocrysts. Overall, Archaean crustal evolution in SerN included numerous accretion events between 3.6 to 2.6 Ga, involving repeated intrusions of diverse suites of granitic and mafic rocks. In contrast, the Paleoproterozoic evolution of the SerN was less complex. A granite event that occurred in several episodes over the time range 2.25 to 2.07 Ga has been identified. This was associated with crustal shortening, folding and metamorphism related to the Transamazonian orogeny.

Three Archaean granitic massifs have been studied in the SerN: Araci (in the east), Ambrosio (in the central region) and Requeijão (in the west). Our data show that Archaean granitic plutonism was extensive in the SerN. It was bimodal and involved medium-K to high-K calc-alkaline magmatism with an associated sanukitoid contribution, which is still not well characterized. These granitoid bodies form ellipsoidal NW-SE elongated domes of variable size and their geochemical characteristics range from low-Al trondhjemitic series to medium-K calc-alkaline series. They have a sub-alkaline and peraluminous character and are similar to the TTGs from eastern Finland [1] but more aluminous. They also show a relative enrichment of LILE related to HFSE, which is in concert with their prominent negative Nb and Ti anomalies and their fractionated HREE. These traits can be correlated with a subduction environment. The studied massifs generally show depleted mantle model ages (double stage) ranging from 3.12 to 3.17 Ga and $\varepsilon_{Nd}$ of 0.2 to 0.9. Isotopic data indicate that these rocks have varying contributions from Archaean crust.

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**Reference**

[1] Martin, H. (1994) In *Developments in Precambrian Geology 11*. (ed. Condie, K.C.), pp. 205-259.