

A Proposed Early Precambrian Island Arc With Extrusive and Intrusive Boninites, Eastern Part of the Baltic Shield

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Large volume of boninite-like 2.49-2.39 Ga gabbro-norites (Alapieti e.a.,1990), 2.39-2.33 Ga volcanites and also many bodies of 2.4-2.2 (2.0) Ga diorites or coronites of Russian Karelia (Romanko e.a.,1993-97) are of special interest concerning important metallogeny (PGE with Pd-profile, Fe-Cr-V(-Co), Ti, poor Cu-Ni and Ag(Au)), principal AR/PR boundary with problematic komatiites/boninites change and other Earth's evolutionary events. We have up to epidote-amphibolitic metamorphism in volcanites with moderate mobility of H₂O, CO₂, K, Rb, Cs while pyroxenes relic are in intrusives. Some geochemical rock peculiarities are following: moderate LILE- and LREE-enrichment with non-depletion of HFSE; U-like REE-profile is only in intrusives; Al₂O₃/TiO₂ less than 35 comparing to known Tertiary boninites as Low Al is a typical for Early Precambrian andesites; LAVAS: $\epsilon_{\text{Nd}} = -0.6$, $N=1$, $^{87}\text{Sr}/^{86}\text{Sr}$ or $^{137}\text{Sr}/^{136}\text{Sr} = 0.7042$ (isotopy is by Balashov e.a.,1992-95), and INTRUSIVES: $\epsilon_{\text{Nd}} = -2.5$ - -1.4 , $^{137}\text{Sr}/^{136}\text{Sr} = 0.7026$; $\text{Eu}/\text{Eu}^* = 1.18$ - 0.82 and 0.67 in dacites; MgO often more than 7-8%, specially in intrusives. There is an analogy in geology, geochemistry and metallogeny of rocks studied with Paleoproterozoic boninites of Bushveld, Antarctica, Greenland etc. (Crawford e.a.,1989). Fennoscandian rocks investigated are differ from the Tertiary boninites mainly by: lower Mg in rocks and Olivine Mg#; lower PH₂O and fO₂ and higher Cl(F)-fugacity of melts, moderate metasomatic enrichment of a giant upper mantle protolith (e.x. boninites of more than 700 km long Pasvik-Pechenga-Varzuga belt) in LILE, LREE and even Ti etc. Interesting 2.8 Ga boninites are just revealed in the North Karelia (Schipansky e. a., 1999).