

East Scandinavian Palaeoproterozoic basic large igneous province (ESCLIP): long duration and multiphase magmatic processes

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The intracratonic ESCLIP of the plume origin jointly with the Canadian-American Laurentian domains have been reconstructed from the end of the Late Archaean (> 2550 Ma) as a part of the epi-Archaean Kenorland supercontinent, which existed till the epoch of about 2100 Ma ago marked with the beginning of the Svecofennian palaeocean formation. On the territory (> 0.5 million km²) of the East Finland, Kola Peninsula and Karelia ESCLIP is represented by the Early Proterozoic (2540–2200 Ma) rifting sedimentary-volcanic suits, dyke swarms and ultrabasic-basic intrusives. The barren, but with considerable amounts of Cr, Ni, Cu and PGE, fertile leucogabbonorite magma layered at the stage of 2525–2515 Ma ago during its crystallization. At the next stage of magmatism (2505–2490 Ma ago), a more melanocratic gabbonorite injection formed a new series of differentiated rocks and sulphide ores of the Monchegorsk and Fedorovo-Pansky massif deposits with industrial contents of Ni, Co, Cu, PGE. Two more stages of the ore-magmatic system formation in large bodies of the belt, their age being 2.47Ga and 2.45Ga, have been defined in leucogabbonorite-anorthozite rocks with the low-sulphide Pt-Pd (\pm Rh, Au) mineralization, in the “reef” beds Fedorovo-Pansky deposits (Mitrofanov, 2005). The Kola Belt magmatism finished at dykes of gabbonorites and monzodiorite of Imandra lopolith with the age of 2395 \pm 5 Ma. Time span of the magmatism and ore formation of the superplume system has been defined as about 130 Ma (2.52–2.39Ga), obtain similar non-depleted mantle trends: petrochemical (Mg, Fe \rightarrow Ca, Al), REE, isotopic ($\epsilon_{Nd}(T)$, Isr, He³/He⁴, etc.) and ore-bearing (Cr, Ni, Cu, PGE, Ti) which testifies to its prior plume origin.

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