

PALEOPROTEROZOIC TECTONIC EVOLUTION AND RELATED METALLOGENY OF THE EASTERN BALTIC SHIELD AND VORONEZH CRYSTALLINE MASSIF OF THE EAST EUROPEAN CRATON

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Three extension-compression cycles are known in the Palaeoproterozoic evolution of the Kola-Karelian orogen, at 2.5-2.25 Ga, 2.25-2.00 (1.95) Ga and 2.00-1.78 Ga. They were followed by 1.8-1.67 Ga late-collisional and anorogenic magmatism. Voronezh crystalline massif is characterized by reduced history that includes only 1st (2.65-2.25 Ga) and 2nd (2.25-2.05 Ga) cycles immediately followed by late-collisional and anorogenic intrusions of 2.08-1.87 Ga age. The onset of Paleoproterozoic evolution is marked by intrusions of layered mafic-ultramafics with related Cu-Ni-Pt ores and Ti-bearing gabbro-anorthosites in Kola-Karelian orogen and A-type granitoids and continental lavas in Voronezh area. Extension stages of each cycle resulted in deposition of volcano-sedimentary sequences in riftogenic basins with Cu, Cu-Co, U-Pt(PGE)-Au-Cr-V, Cu-Zn (Ag) and Ni-Co mineralization. In Voronezh area these sequences host world-class Fe deposits. Pechenga-Imandra-Varzuga (Kola Peninsula), Circum-Karelian (Karelia) and Livny-Bogucharov (Voronezh massif) riftogenic belts evolved as intracontinental oceans. Picrite magmatism of oceanic island type in Pechenga structure was accompanied by formation of extensive Cu-Ni ores. Specific type of Cu-Ni mineralization is chained with mafic-ultramafics that intruded passive margin sedimentary assemblage of Livny-Bogucharov ocean. During final collision volcano-sedimentary successions of riftogenic basins and intracontinental oceans were transformed in suture zones, some of low-crustal assemblages were included in thrust-nappe Lapland granulite belt (Kola Peninsula). Late- and postcollisional rheomorphism and doming accompanied by metamorphism, remobilization and redeposition of earlier mineralization resulted in an origin of Al (kyanite) deposits, mica and Ta-Nb pegmatites and Au-bearing lodes. Mo, U and P-Fe mineralization appeared in connection with anorogenic intrusives. Some Cu-Ni ore bodies are localized in mantles of granite-migmatite domes in southern vicinity of Pechenga structure above former subduction zone.