



Orogenic magmatism in Western Lithuania

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Lithuanian territory is situated on the western margin of East European craton, where Precambrian crystalline crust is covered by thick sequence of sedimentary rocks. There are revealed two principal domains in the crust of Lithuania differing in the structure, composition and geological history - West Lithuanian Granulite Domain (WLGD) and East Lithuanian Belt (ELB). The junction zone between WLGD and ELB, named Mid-Lithuanian Suture Zone (MLSZ) is characterised by transitional structure of crust and specific lithotectonic complexes. Formation of continental crust took place in course of Svecofennian orogeny (1, 9-1, 8 Ma). WLGD crust was formed in course of accretion to N-NE, while ELB - by accretion to the NW in course of collision between WLGD and ELB lithospheric plates.

Evidences of such model are provided by new data on orogenic magmatism in WLGD.

Complex of volcanic and plutonic rocks characteristic to subduction related tectonic setting is revealed in MLSZ. Amphibolites – primary basalts or diabases are widespread in its eastern side, while presumably Hyp-Hbl-Bt-Fs-Qtz gneisses with characteristic porphyry texture of dacitic and andesitic composition are predominant in western side. Metavolcanics are intruded by plutons of gabbro-diorite-granodiorite, mainly belonging to calc-alkaline series.

In WLGD charnockitoids and granitoids occupy largest territories. The size of Kuršiai pluton in northern part of WLGD is roughly 80x140 km. Pluton is manifested by negative gravity anomaly and fixed by 80 wells. It is composed by different charnockitoid varieties: charnockite, enderbite, opdalite, mangerite. Average content of SiO₂ is 62-63%. Texture is middle to coarse grained, often porphyry with K-feldspar or plagioclase phenocrysts up to 3-4 cm large. Rocks are often deformed, with gneissic structure and mortar or mylonitic texture. Charnockitoids are ferroneous, peralumi-

nous, calcic or alkali-calcic, subalkaline, mainly potassic. They reveal S-type granite characteristic, often contain garnet and imply tectonic setting transitional from orogenic to cratonic.

Granitoids form smaller, but more numerous plutons. They are biotitic, often with garnet and cordierite, with S-type characteristics. Texture is middle to coarse grained, porphyry, with microcline phenocrysts, often gneissic.

Age (U-Pb method in zircon) of andesitic and dacitic metavolcanics in MLSZ is 1842 ± 6 Ma (well Virbališkis-434); intruding calc-alkaline granodiorite – 1837 Ma (well Žeimiai-347) (Rimsa et al., 2001); age of charnockite of Kuršiai pluton – 1815 ± 20 Ma (well Vydmantai-1) (Claesson et al., 2001) and 1846 ± 12 Ma (well Macuičiai); granite – 1844 ± 4.5 Ma (well Kužiai-65) and 1837 ± 6 Ma (well Graužiai-105). Dating indicate, that subduction related metavolcanics and calc-alkaline intrusions in MLSZ and charnockitic-granitic plutons in WLGD are roughly synchronous and might be related to subduction of ELB plate beneath WLGD plate. These data imply that WLGD at the stage of collision was already cratonised. Thus WLGD continental crust is older (>1850 Ma) as compared to the age of ELB continental crust (<1840 Ma).