

## **Abstract**

The French Massif Central belongs to the Moldanubian Zone, which is an internal part of the Variscan Orogen. The Massif was formed during six tectonic-metamorphic events and has a nappe structure. The Muscovite-bearing Peraluminous Granitoids (MPG), Cordierite-bearing Peraluminous Granitoids (CPG), K-rich Calc-alkaline Granitoids (KCG), and Amphibole-bearing Calc-alkaline Granitoids (ACG) types of granitoids were intruded into the nappe units during the Carboniferous. The formation of FMC granitoid plutons was predominantly linked to continental collision; only the ACG plutonites are older, typical of magmatic arcs. These amphibole-bearing calc-alkaline quartz diorites to tonalites are common in the western French Massif Central (Limousin region), where a 250 km long belt known as the “Limousin tonalite belt” is found. Its linear shape and characteristic geochemical composition suggest a subduction-related origin.

Newly obtained geochemical data from the Limousin region indicate an intermediate composition (52–57 wt% SiO<sub>2</sub>), a metaluminous, subalkaline character, and place the samples in the calc-alkaline series. Furthermore, enrichment of Large Ion Lithophile Elements (LILE), depletion of High Field Strength Elements (HFSE), negative europium anomaly ( $Eu/Eu^* = 0,63–0,92$ ) and relatively low initial ratios of strontium isotopes ( $^{87}Sr/^{86}Sr_i = 0,7043–0,7053$ ) were observed together with mainly positive values of  $\epsilon_{Nd}$  (+4,7 to –1,0). Taken together, all the characteristics of the samples probably indicate a genesis related to subduction on an active continental margin. The existence of a subduction zone at the early stage of the Variscan Orogeny in the French Massif Central completes the idea of the geological development of this area.

## **Key words**

igneous rocks, Variscan Orogeny, French Massif Central, geodynamics, subduction, whole-rock geochemistry, major-elements, trace-elements, R language.