

Abstract

The Saxonian Granulite Massif in the Saxothuringian Domain of the Bohemian Massif, is represented by a single granulite body consisting of felsic and mafic granulites formed during Variscan tectono-metamorphic event. The granulites with peak metamorphic P – T conditions of ~ 2.3 GPa and 970–1060 °C (Fuhrman and Lindsley, 1988; Rötzler and Romer, 2001) were exhumed and emplaced into the palaeozoic sedimentary cover sequence, which resulted into contact metamorphism affecting these metasedimentary rocks and development of a contact metamorphic aureole. In the map view, the granulite body has elongated shape with the long axis oriented in NE-SW direction and it is surrounded by the so called schist mantle reflecting the extent of the contact metamorphic aureole. Within two kilometers distance away from the contact with granulite body, the metamorphic grade in metasediments decreases from cordierite gneiss, andalusite bearing micaschist to phyllite. Detailed field structural analysis in the studied area revealed a deformation record associated with four main deformation phases. In granulites the oldest deformation fabric contains kyanite and sillimanite. This fabric is locally overprinted by the subhorizontal green schist facies fabric, mainly along the margins of the granulite body. In metasediments, the original sedimentary layering can be locally identified. In the vicinity of the contact with the granulite body, the metasediments show subvertical fabric, which contains or is overgrown by the contact metamorphic minerals. This originally NE-SW trending fabric is isoclinally folded and overprinted by the subhorizontal axial-planar green schist facies foliation. The subhorizontal NE-SW fold axes rotated to NW-SE orientation parallel to stretching lineation. All fabrics mainly in metasediments are subsequently affected by two episodes of post-metamorphic folding. The first one is more pronounced and results into development of m- to km-scale open folds with subvertical NE-SW trending axial planes and subhorizontal axes. The later folding is less important and it is associated with formation of kink bands with NW-SE trending axial planes and subhorizontal axes. Our P – T results, which are $P \sim 3,5$ kbar and $T = 530$ – 620 °C suggest the isobaric increasing of metamorphism in the schist mantle during the rapid exhumation and emplacing into shallow crustal levels. In the close contact with the granulite body the schist mantle reach the conditions of partial melting. The contact metamorphic aureole of the surrounding metasediments is developed in association with steep deformation fabric, which was later affected by subvertical shortening probably shortly after the exhumation of the granulite massif.