1. Introduction

Granulites exposed on the earth's surface and found as xenoliths in basaltic volcanic rocks provide important information on the nature of the lower crust, as well as on the processes associated with crustal growth. Preserved high-grade mineral assemblages and successive lower pressure and/or high temperature overprints in granulites represent clues to the reconstruction of their P-T-t paths.

Bohemian Massif, which belongs to the Hercynian belt of central Europe (Fig. 1.1) is rich in granulite rocks occurrences. In its N part, granulites are present not only in Saxony and Erzgebirge in Germany, but also in the north Bohemian crystalline basement (Fig. 3.1). This work is concerned with the latter ones, encountered in the České středohoří Mts. area, on the E slope of the Erzgebirge (Krušné hory Mts.) and in the Ohře crystalline area. Previous studies in this area consist mainly of mapping (e.g. Hibsch 1920, Sattran & Kopecký 1967), petrography (e.g. Zartner 1929, Sattran 1967) and geochemistry (Fiala 1965, Rost & Grigel 1959). The key geographical position of the high-grade rocks studied in the axial zone of the Variscan orogenic belt accentuates their importance in the construction of geodynamic model of the belt.

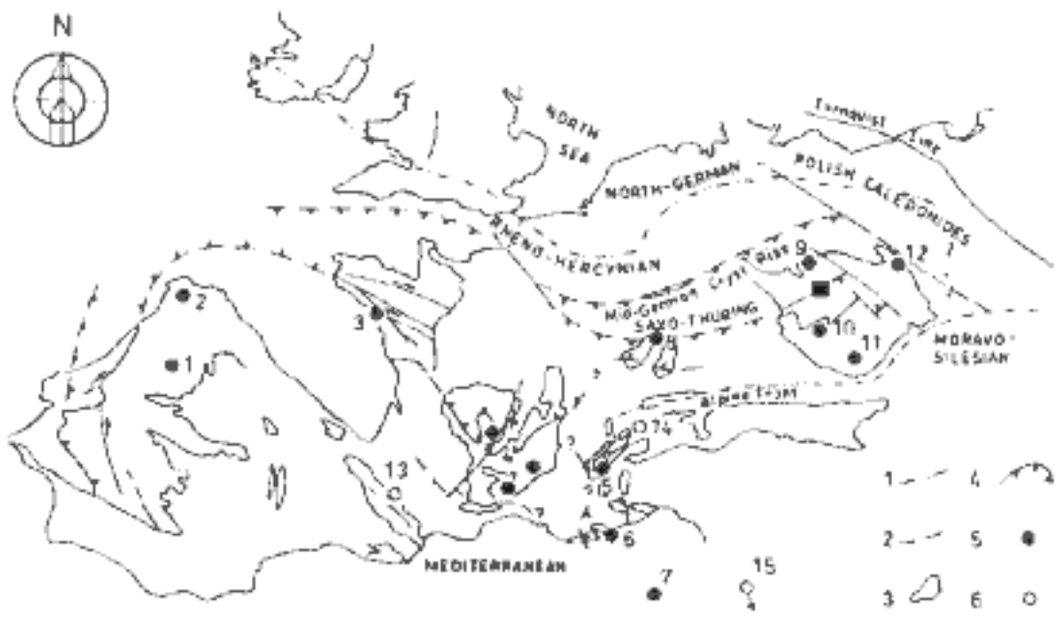

Fig. 1.1 *Main structural elements of the Variscan belt of Europe, with indicated outcrops of Variscan basement and granulite occurrences, including the position of the studied area (black square). Compiled according to Franke (1989) and Vielzeuf & Pin (1989). 1+2 - outer limits of Variscan and Alpine deformation, resp.; 3 - contours of Variscan massifs; 4 - major thrusts and suture zones; 5 - type I granulites; 6 - type II granulites; numbers 1 to 15 correspond to: 1 - Braganca-Morais Complex of Northern Portugal, 2 - Western Galicia Complex, 3 - Southern Brittany, 4 - Massif Central, 5 - External Crystalline Massifs of Western Alps, 6 - Maures Massif, 7 - Corsica-Sardinia Block, 8 - Vosges-Schwarzwald Massif, 9 - Saxony, 10 - Bohemia, 11 - Lower Austria, 12 - Polish Sudetes, 13 - North Pyrenean Zone, 14 - Ivrea Zone, 15 - Southern Calabria.*

The interpretation of these granulite occurrences is closely related to the problems of granulites in general, such as:

- autochthonous or allochthonous character of units containing granulites (Harley 1989, Vielzeuf & Pin 1989)
- protoliths and the nature of granulites, character of lower crust, proportion of ortho/para-derived and acid/basic rocks in lower crust (Vielzeuf 1984)
- relation between granulites and granites (Clemens 1990, Vielzeuf et al. 1990)
- depleted or undepleted character of granulites (Rudnick & Presper 1990)
- role of dehydration or partial melting (Thompson 1990, Vrána & Jakeš 1982, Vrána 1989) and CO_2-rich fluids infiltration (Newton 1989, Frost et al. 1989) in the formation of granulites
- validity of PT estimates in granulites (Frost & Chacko 1989, Kotková 1991)
- P-T conditions of granulite metamorphism (Bohlen 1987, vs. Harley 1989), evolution of granulites (reaction textures), significance of P-T-t paths in granulites (Harley 1989)
- relation of granulites to the retrograde P-T-t paths of eclogites
- ages of granulite metamorphism (Pin & Pecaut 1986, Vielzeuf & Pin 1989, Mezger 1990)
- relation of granulite formation to tectonic and metamorphic phases of a region, geodynamic interpretation (here constrained to the Variscan belt; Vielzeuf 1984, Carswell 1991, Rötzler J. 1992, Vrána 1992)
- interactions between lower crust (granulites) and upper mantle (peridotites) (Jakeš et al. 1985, Carswell & Cuthbert 1986, Medaris & Carswell 1990, Gardien et al. 1990)

Particular questions concerning the studied area are:

- Do the granulitic occurrences represent a single body or several ones?
- What are their relations to their host rocks and neighbouring units (Krušné hory Mts. crystalline complex)?
- What implies presence of granulite complex rocks at the northern limit of the axial zone of the Variscan belt (Variscan reactivation and/or heritage of Cadomian basement)?
- Is the nature, P-T of metamorphism and evolution compatible with other granulite occurrences in the Bohemian Massif and the Variscan of Europe?

The aim of this work is to bring some answers on above given questions.

2. Geothermobarometry and P-T-t paths in granulites

Granulites represent a good material for geothermobarometry because of the prevalence of unhydrous phases in granulite facies and availibility of thermodynamic data for these phases. Moreover, preservation of reaction textures in these rocks is very useful for the determination of the P-T trajectory. Other important indicators of the P-T path are inclusions of earlier phases in minerals and mineral zonation. The basic principle of the analysis of P-T-t paths is the assumption that the rock records the succession of equilibrium states, which can be analysed using equilibrium thermodynamics (Spear 1989). Reconstruction of the P-T path is conditioned by the definition of pre-, syn- and post-tectonic assemblages (Spry 1969, Vernon 1978), and facilitated by experimentally derived petrogenetic grids (e.g. Thompson 1976b, Vielzeuf & Boivin 1984).

P-T paths followed by metamorphic rocks reflect a complex