followed by a near isothermal retrogression at 590–640 °C/16–8 kbar. Based on different compositions of core garnet (garnet 1) in metabasites in the Wölzer Tauern, two metamorphic events of amphibolite facies conditions can be distinguished: The older (Variscan?), medium-pressure metamorphism in the upper Rappold Complex and a Permin (Schuster and Thöni 1996), low-pressure metamorphism in the underlain Wölzer Complex are assumed.

Because of strong retrogression, evidences of Alpine eclogite facies metamorphism are locally preserved in some metabasites in northern parts of the Koralpe and Saualpe Complex. The peak high-pressure minerals are garnet, omphacite, rutile and phengite. Metamorphic conditions estimated using garnet and omphacite indicate ca 690 °C and minimum pressure of 13 kbar, based on jadeite content (Jd = 27 mol%). Mineral assemblages in metapelites yielded temperature of 700 °C at 15 kbar. Retrograde history in metabasites is documented by several stages of mineral growing and extensive retrogression which led to subsequent low-pressure eclogite – amphibolite/greenschist facies assemblages after the high-pressure assemblage.

Both the Wölzer and Rappold Complexes experienced Alpine metamorphism of similar P-T conditions (550–650 °C at 10–11 kbar). Based on mineral assemblages in the Permin Rannach Formation, a temperature of 500–540 °C at 8 kbar was estimated for Alpine metamorphism in the northern part of the Austroalpine basement units, east of Tauern Windows. The presented data from the Eastern Alps indicate different metamorphic history in terms of timing, degree and nature of metamorphic evolution. Three metamorphic events with different P-T conditions are distinguished in the Austroalpine basement units: Early Variscan eclogite facies, Variscan medium-pressure amphibolite facies and late Variscan low-pressure amphibolite facies metamorphism. This metamorphic evolution suggests subduction of continental and oceanic elements during Silurian–Devonian and continent-continent collision between Gondwana-derived continental elements and northern portion of Central European Variscan Belt. P-T conditions of Alpine metamorphism estimated for Austroalpine units indicate a subduction type geotherm of Ca 12–14 °C/Km. The Koralpe and Saualpe Complex represent the deeper portions of subducted slab.

References


Fig. 1. Map of epicentres of microearthquakes occurred in West Bohemia/Vogtland/NE Bavaria region during 2000.
Sections in the Luleč and Olšany quarries were studied during the work on the project: "Exhumation of the Variscan lower crust – constraints from the Viséan siliciclastics (Eastern Bohemian Massif)". This study has been materialised as a part of basin analysis supporting numerous special studies on comparison of pebble material, greywacke matrix and supposed crystalline source rocks (various methods of comparative petrology and mineralogy, dating, special geochemistry, etc.)

The quarries in operation are situated close to the villages of Luleč and Olšany in brachystructures of identical names. From the viewpoint of local lithostratigraphy both quarries belong to the upper member of the Myslejovice Formation, i.e., to the Luleč Conglomerates.

The conglomerate at the Luleč quarry is composed of 78% metamorphic rocks (gneisses, granulites, mica-schists and quartzites), 19.5% magmatic rocks (granites, effusive rocks, durbachites) and 2.5% sediments (greywackes, shales). The above-mentioned analysis differs from average composition of the Luleč Member in the entire Drahany Culm by higher amount of magmatites and lesser share of sediments (Štelcl 1960).

The study was focused on definition of the depositional environment of conglomerates. There are three basic lithotypes in the quarries: conglomerate, sandstone (greywacke) and mudstone. Conglomerates are cropping out in the lower part of the section at Luleč quarry. They are clast supported, polymict, coarse, with well-rounded pebbles, cobbles and boulders, poorly sorted in coarse grained sandstone matrix. The largest clasts are over 1 m in diameter. The lower contacts of conglomerate bodies are erosional.

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