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**VARIATION IN MINERAL ASSEMBLAGES AND METAMORPHIC
ZONATION IN AMPHIBOLITES OF NORTHERN PART OF THE
JESENÍK MASSIF
(EAST SUDETES, NE CZECH REPUBLIC)**

Extensive amphibolite outcrops located in the vicinity of city Jeseník (East Sudetes) are termed the Jeseník Amphibolite Massif. The amphibolites belong to amphibolite facies, and their metamorphism is considered to be Variscan (Souček 1981). Their protolith was supposedly volcanic-clastic material with significant amount of pelitic and/or carbonaceous material; intrusive basic rocks were subordinate (Souček op. cit.). In this abstract I present the results of detailed petrographic study of the amphibolites forming the northern part of the Massif.

Four amphibolite types were distinguished in the northern part of the Jeseník Massif:

- (1) layered amphibolites consisting of amphibolitic and calcitic layers (valleys of Šumny and Výchovistní streams). Amphibolitic layers consist of tschermakite or magnesiohornblende, andesine and subordinate quartz plus biotite. Chlorite and epidote of retrogressive origin occur. Ilmenite and titanite are accessories. The amphiboles are zoned with silica content increasing towards rims. The plagioclase is inversely (26→41 % An; Vrchovištní stream) or normally (37→21; Šumny stream) zoned. Small amounts of K-feldspar occur locally. Calcitic layers consist of calcite and subordinate quartz and locally plagioclase.
- (2a) layered amphibolites consisting of amphibolitic and calc-silicate layers (eastern cover of Žulová granitic massif). Amphibolitic layers consist of Mg- or Fe-hornblende or Fe-tschermakite, plagioclase and quartz. Retrograde chlorite, prehnite, epidote-clinozoisite and pumpellyite occur. Ilmenite and titanite are accessories. The amphiboles are zoned with silica content decreasing towards rims. The plagioclase is inversely zoned (26→33 % An; Písečna). More basic (labradorite – bytownite) and normally zoned (85→59 % An) plagioclase occurs to the north of Písečna. Calc - silicate layers consist of diopside, plagioclase, quartz and younger actinolite, epidote, chlorite, muscovite and prehnite. Calcite is locally present in small amounts.
- (2b) layered amphibolites similar to those of type 2a but containing also biotitic layers consisting of biotite ($Fe/(Fe+Mg) = 0,45-0,48$), chlorite and ilmenite (the Bukovice quarry).

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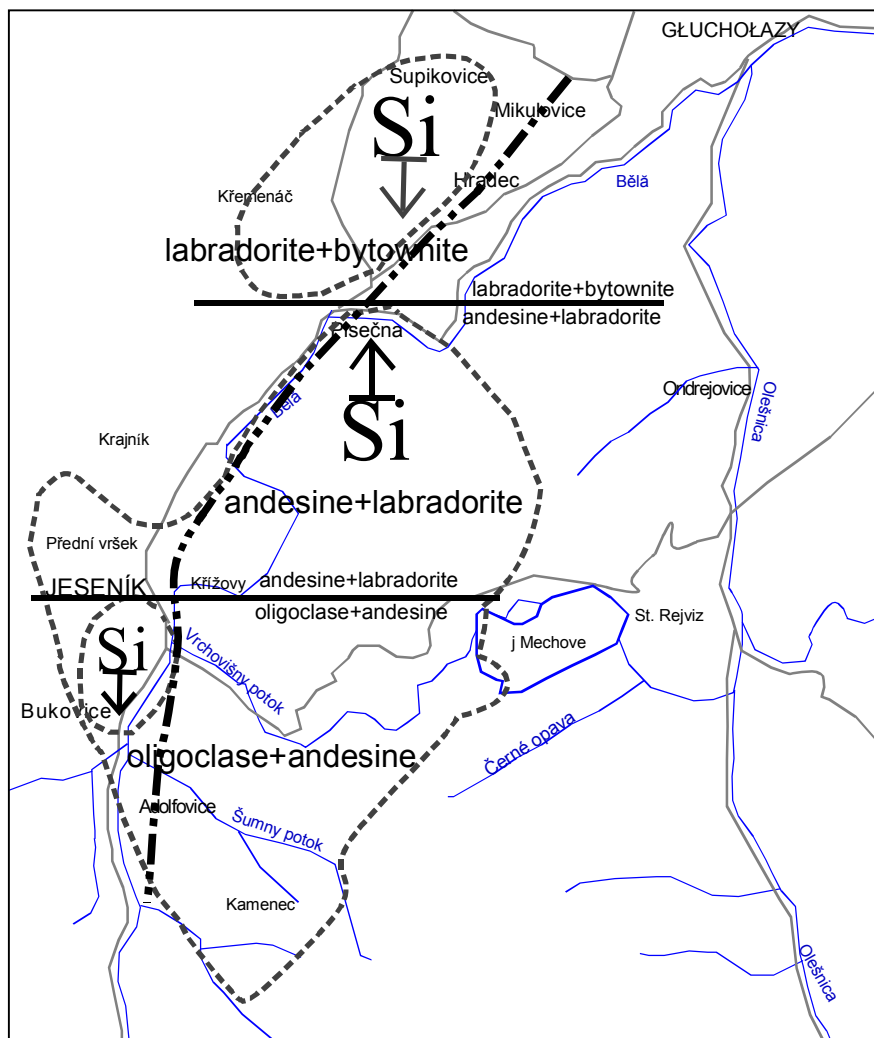


Fig. 1. Distribution of plagioclase feldspar compositions and amphibole zoning types (Si decreasing or increasing towards grain margins) in the amphibolites of northern part of the Jeseník Amphibolite Massif. The dash-and-dot line shows the border between western and eastern parts of the massif. Location of roads and streams shown for orientation.

- (3) amphibolites of structure similar to the ophitic one of igneous rocks (Křížový vrch) occur as relics up to 3 cm within the layered host. Amphiboles are tschermakitic with silica content increasing towards margins. Two populations of normally zoned plagioclase (46→30 and 63→56 % An) occur in this kind of amphibolite, accompanied by small amounts of K-feldspar. Quartz, chlorite and

ilmenite occur in small amounts. The layered host contains Mg-hornblende with silica content increasing towards margin. The plagioclase is inversely (31→47 % An) zoned.

- (4) massive amphibolites (Písečna) contain tschermakite/Mg-hornblende whose silica content is constant or slightly increases towards margins. Plagioclase is zoned from 52 % of anorthite in cores to 28 in rims.

The presented data reveal two regions of different amphibole zonation scheme (Fig. 1). The first one is characterized by retrograde zonation of amphiboles (silica content increasing towards margins). This region is located in southern and eastern part of the studied area. The second one is characterized by amphibole of prograde zonation and is located in the northern and north-western part of the studied area.

Anorthite content in plagioclase increases from the south to the north. The amphibolites occurring in the southern part of the region contain oligoclase/andesine, those occurring in the centre contain andesine/labradorite, and those occurring to the north – labradorite/bytownite (Fig. 1).

The calc silicate layers of amphibolites occurring in the west contain diopside and small amounts of calcite. Those occurring in the east contain mainly calcite (Fig. 1). Moreover, prehnite (\pm actinolite, \pm pumpellyite) is common in the western amphibolites and was not found in the eastern ones.

The described metamorphic zoning differs significantly from that presented by Krejzlíkova (2000) and Krejzlíkova et al. (2001) who assume the increase of metamorphic grade from the east to the west. The data presented in this abstract show that (1) the retrogressive low –grade (prehnite) metamorphism affected the amphibolites of the Žulová pluton cover, and that (2) the metamorphic evolution of amphibolites occurring in the east and the west was different.

Acknowledgments. This study is a part of the KBN grant no 6 P04D 070 20.

REFERENCES

- KREJZLÍKOVA L., 2000: Structural evolution and Metamorphic Zoning of Jeseník amphibolite massif. *Geolines*, 10, 43-44.
- KREJZLÍKOVA L., SCHULMANN K., LARDEAUX J., STÍPSKÁ P., LEXA O., GARDIEN V., 2001: Influence of microstructures on rheology of amphibolites during folding: Example from Jeseník amphibolite massif. *Mineralogical Society of Poland Special Papers*, 19, 94-96.
- SOUČEK J., 1981: Geochemie devonských metabazitu Hrubého a Nížkého Jeseníku. - *Čas. Mineral. Geol.*, 26, 125-14.