

## BOOK REVIEW

HOVORKA D. et al.: Ultramafic rocks of the Western Carpathians, Czechoslovakia. Geologický Ústav Dionýza Štura, Bratislava 1985, 258 pages, 52 tables, 59 figures, 45 plates of photographs, 1000 copies, 45 Kčs.

In the last decades considerable attention is paid to the occurrence and study of ultrabasic rocks as evidences of oceanization periods in geodynamic evolution of definite areas. The reviewed book, edited by Dušan Hovorka, associate professor of the Comenius University in Bratislava, presents the results of recent studies of Slovak geologists and petrologists on ultrabasite bodies occurring in different tectonic units of Western Carpathians. These bodies, fairly diversified and usually rather small in size, were found to occur but occasionally within granulites of the Tatrides (Vélka luka ridge in Mala Fatra Mts., Myto nad Dumbierom, Liptovska Lužna—Roztocká dolina valley in Nizke Tatry Mts.) and in metamorphites of Veporidic Kraklová zone (Hron river valley). They are more abundant in the Kohut zone of Veporides (7 localities) and, particularly in Inner West Carpathians where metaultramafite and ultramafite bodies are reported both from Paleozoic gneiss-amphibolite complex and greenschists of the Rakovec and Dobšina Groups and Triassic schists of Meliata Group in the Gemerides (Slovenske and Spišsko-Gemerske Rudohorie Mts.). The majority of these bodies occurs on N and S side of the Volovec anticlinorium, at the northern margin of Gemicum, close to the Margecany—Lubenik lineament.

The present book contains fairly detailed data on geologic position, chemical and mineral composition and geochemistry of all the ultramafics in question, based on classical and microprobe analyses of rocks and minerals and modern methods of mineralogical study.

As follows from these data, ultrabasites found in Mesozoic series are, in general, lizardite-chrisotile serpentinites in character whilst metaultramafics from Paleozoic metamorphic rocks are represented predominantly by antigorite serpentinites, containing also talc, tremolite, chlorite, carbonates and magnetite. Special attention is paid by the authors to metasomatic alteration products of ultrabasic rocks—listvenites and rodingites, as well as to associations of accompanying ore minerals. The role of ultramafic rocks in metallogenesis of Western Carpathians and the results of detailed meso- and micro-structural analysis of the fabric of serpentinite bodies are presented. Very interesting is the chapter devoted to serpentinization and serpentine minerals, in which e.g. the origin and textures of chrisotile asbestos veinlets is discussed and illustrated.

The last chapter of this interesting monograph deals briefly with a comparison of Mesozoic ultrabasites in the Carpathian Arc (including outer Flysch and Pie-



niny Klippen Belts) and in the Pannonian Massif. It should be emphasized that in outer Western Carpathians, most interesting for Polish geologists, all the volcanics correspond geochemically predominantly to within-plate (teschenites, limburgites) and island-arc or active continental margin type (Pieniny Klippen Belt). In the latter case clastic Cr-spinels, serpentinite and glaucophane schist pebbles were also found indicating subduction of coexisting oceanic material. When dealing with this problem, the author used twice the old term "Cretaceous Krosno unit" (pp. 193 and 203) which should be replaced by generally accepted and also used in this book on p. 8 "Tešin Unit". Very problematic are also the reported results of old colorimetric determinations of  $TiO_2$  in ultramafites from Szarvaskő area in the Bükk Mts. (5 to 8 wt. per cent ??) – p.195. Further comparative data refer to volcanics and ultrabasites of the Eastern Carpathians (USSR and Romania) where bimodal initial volcanites are locally related with Upper Jurassic–Lower Cretaceous beds of the Flysch belt whilst probably ophiolitic rock olistholits – with Transilvanian nappes.

In Southern Carpathians ultramafic rock bodies occur in several units but only those of the Severin nappe and Mureș zone in the Apuseni Mts., accompanied by subduction-related volcanics, may be considered to represent ophiolitic association.

In Hovorka's opinion, true ophiolites are lacking in the Pannonian area where all the volcanics are predominantly within-plate in character, being related rather to rifting stage.

Summing up his review, the Author concludes that bodies of metamorphic peridotites (representing the lowermost member of an ophiolite association) occur only in the innermost tectonic units (Meliata Group) of Western Carpathians, within Severin nappe of Southern Carpathians and in Transilvanian nappes in Eastern ones. All these occurrences display characteristic features of serpentinite mélange. According to recent studies, gabbro-peridotite bodies of the Bükk Mts. and Apuseni Mts. belong to ophiolitic suite but originated in marginal basins and subsequently obducted upon island arc. Traces of subduction zones marked by the occurrence of fragments of blueschists were found in the Pieniny Klippen Belt, Gemeric Meliata Group and in the "Black Flysch" series of E Carpathians. It should be emphasized that the bodies in question emplaced in Paleozoic series are mostly massive whilst those from Mesozoic sequences – tectonically strongly crushed. Different geologic history of ultramafic rock bodies studied is also reflected in associated ore mineral assemblages and in their geochemical features. It is obvious that such very general analysis of the reviewed monograph cannot take into account all the interesting data and opinions presented by its Authors. One of the very few critical remarks refers to some terms (e.g. rock filling, disunity) used and, locally, very complicated sentences in English translation, rendering sometimes the text hardly comprehensible to foreign reader.

Closing, it should be strongly emphasized that Hovorka's monograph is a highly valuable contribution to general geology of the Carpathians and its geodynamic evolution. It is hoped that Ars Polona and Orpan will import a proper amount of this book to fulfill the needs of numerous Polish geologists interested in it.

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