

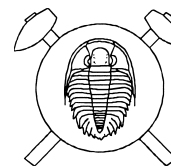
Leptynite-amphibolite complex: Unifying element of the central European Variscides

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In the variscan crystalline basement of the Eastern Alps and the Western Carpathians, as well as in some variscan and simultaneously in Proterozoic terranes of the Bohemian Massif banded bimodal metavolcanic complexes are known to occur. They have been originally entitled in the western European variscides as „leptynite-amphibolite complex“ (Forestier 1961). In papers of various authors there are used also the other denominations (banded amphibolites, amphibolite-orthogneis complex ao.) of the complex under consideration. We use the original name modified by Briand et al. (1995).

Discussed complex do occurs in several geological units of the variscan basement of the Eastern Alps eastward of the Tauern window and in the central (tatricum, veporicum) as well as in the inner (gemericum) Western Carpathians zones. In the Bohemian Massif identical lithologies are known to occur both in the variscan and Proterozoic consolidated terranes.

In all three mentioned mega units complexes under consideration have more-or-less identical lithology. They are characterized by manifold vertical alternation of light (granulites, leptynites, orthogneisses) and dark (amphibolites) bands. Their thickness is very different: it varies from few millimetres up to several decametres. Light bands have character of metarhyolites, metaquartzkeratophyres, in places also bands of metadacitic or even metaleucoandesitic composition are present. Mineral composition is simple: quartz and acid plagioclase in places also low amount of micas. Some bands contain also almandine garnet, and bands of metadacitic and metaleucoandesitic composition also amphibole. For all „light“ lithologies characteristic are medium/high pressure mineral (kyanite, rutile ao.) relics. Generally low Sr and high Rb, and relatively high contents of radioactive elements were detected. Dark bands have geochemical affinities to tholeiites, both of oceanic and continental geochemical patterns.

The complex under consideration has pronouncedly metamorphic fabric. In favour of such interpretation also the presence of high-tempered feldspars, morphology of some accessories as well as only few millimetres thick light and dark bands traceable for tens or even hundreds of meters should be used. Mentioned aspects prove also

for volcanic/effusive/extrusive nature of the majority of partial complexes of the given type.

For individual LAC segments characteristic is the presence of (in various extent hydrated) bodies of ultrabasites and (mostly retrogressed) boudins of eclogites.

LAC in all discussed geological mega units underwent several metamorphic stages. First one has prograde character and originated mineral association is of medium to high grade and of medium to high-pressure ranking. In places processes of anatectic melting and segregation of nests of trondhjemitic mobilizates are observable. On the other hand locally transitions of LAC into the greenschist mineral associations are known to occur.

Geological position of the leptynite-amphibolite partial massives is pronouncedly tectonic. Complex under consideration has nappe-like position being overthrust on metamorphic complexes of various intensity of metamorphic recrystallization. LAC in some occurrences has more-or-less horizontal position; on the other places it is even vertical. Characteristic is its sharp delimitation to the adjacent complexes. As contacts of metaultrabasites as well as eclogites to the main lithology are sharp (no transitional lithologies are developed) and in places even reaction metasomatic rims originated, we consider them to be tectonically implanted bodies of the upper mantle provenience to the LAC during first stages of its uplifting through the continental type crust. Since that moment geological history of banded complex s. s. and incorporated blocks of ultrabasites and eclogites is uniform. Thickness of the LAC is estimated to be several hundred metres (Western Carpathians) up to first thousands of metres (Bohemian Massif).

Concluding we consider LAC as characteristic terrane which originated under specific conditions of subduction which underwent consequent metamorphic recrystallization in the discrete stage of the orogen evolution, which predict the creation of new continent. So this stage is equal to the breakdown of the older and predicts the formation of the new mega continent. In the described case of Pangea, partly also Rodinia and in the case of the Alpine-Carpathian terrane leptynite-amphibolite complex documents the beginning of the creation of the future continental crust.