

Ultramafite-mafite complexes of ophiolite associations: origin and the model of emplacement.

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The revision of traditional notions on the nature of ultramafite-mafite (ophiolite) associations is based on evidence of old radiological dating ultramafites and mafites of these associations (massifs Ronda, Lanzo, Ivrea-Verbano zone, Voicaro-Synnyinsky massif of the Urals) (Koppel, 1974; Reisberg et al., 1986, 1989, 1991; Richard et al., 1980). Along with the relict Early Precambrian dating of the ultramafites and mafites, younger ages have been recognized in them as well, which are indicative of their long-term stay in the process of the migration from the depth to near-surface crustal parts. This is also supported by directed regressive polymetamorphic transformations of the ultramafites and banded mafites. Isotope-geochemical studies of ultramafites and mafites of ophiolite associations show isotope conformity of primarily Early Precambrian rocks of the upper mantle (ultramafites) and the lower crust (mafites). The data are consistent with results of radiological study of deep mantle ultramafite xenoliths from kimberlites of the Kaapvaal Craton (Pearson et al., 1995). Early Precambrian ages of rocks from the consolidated craton crust and the underlying upper mantle to the depth of 250 km are also chronologically conformable.

The ultramafites (metamorphic peridotites according to R. Colman, 1979) and polymetamorphosed mafites from a banded complex in ophiolite associations are fragments of the conformable Early Precambrian upper mantle and consolidated crust displaced (obducted) to upper crustal levels where they occur with volcanogenic-sedimentary rocks differing from the latter in time and conditions of formation. We find it possible to associate the mechanism of their penetration into the upper crustal levels with emplacement of sedimentary basins (Great Vally Basin, California, Torbraiend Basin, Papua New Guinea). In the process of the submergence of the mantle-crustal basement there occurs its extrusion from the centre to periphery of the basins and migration of mantle-crustal ophiolites to the upper crustal levels.