Triassic-Lower Cretaceous cherts and siliceous sediments related to ophiolites of Far East

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Cherts and radiolarian cherts are often deposited in association with magmatic rocks as a part of the ophiolite sequence. These siliceous rocks accompanied by basic and ultrabasic rocks in the ophiolitic mélange, as blocks. The studied radiolarian cherts is good for stratigraphic and geochemical information for paleogeographic reconstruction of the depositional area. The clay minerals are placed in cherts and radiolarian cherts are good indicator for it, too.

Siliceous rocks are widespread in North-Eastern Russia (Sikhote Alin, Koryakia, Sakhalin and other regions). However, zonal stratigraphic dating of cherts units isn't widespread. Therefore, dating unit of radiolarian complexes in Southern Sikhote-Alin is extraordinary object for investigations. The studied radiolarian cherts are a part of the accretionary pile (Taukha terrane); with is built of terrigeneous matrix with megablocs of basalts, carbonates and cherts. The radiolarites in Rudnaya river are of the Triassic and Late Jurassic age (Bragin, 1991, 2000 etc).

The sequence of radiolarian cherts is monotonous and it is comprised of diverse siliceous rocks (Triassic–Late Jurassic) and flysch (Early Cretaceous). The radiolarian cherts are very thin to thick-bedded; the siliceous rocks include siliceous mudstones, gray and light gray cherts, and red jaspers. The red color notes the anoxial horizons.

All the lithologies contain abundant radiolarian remains that were used for dating. The radiolarian assemblages have been identified for each particular time interval, and they are detailed in [Bragin, 1991, 1993, 2000; Kemkin, Kemkina, 1998 etc.]. This study integrates the data on the radiolarians, clay mineral assemblages, and chert geochemistry from various stratigraphic intervals, and correlates these data to geodynamic environment.

We distinguish four of clay minerals assemblages: (1) a sericite assemblage (Indian to upper Olenekian, Triassic); (2) a chlorite–sericite assemblage with micas decreasing and chlorite increasing gradually toward the Norian (or lower Anisian to Norian); (3) a nearly total lack of clay minerals in the siliceous rocks (Rhaetian to Lower to Middle Jurassic); (4) a mica–chlorite–smectite assemblage (Upper Jurassic to Lower Cretaceous) (fig 1). Terrigeneous admixture in cherts depends on the composition of the source provenance. And the change of clay mineral assemblages indicates the change of source. The composition of clay minerals of another cherts units (river Ussury, river Khor), are differ from Late Jurassic deposits, and show the presence of kaolinite (Volokhin et al.., 2003). Perhaps, the cherts with kaolinite are deposited not far from continental margin, from which comes a clastic material.

On geochemical diagrams (Adachi, Yamamoto, 1986), these cherts plot in the non-hydrothermal field, and are therefore sedimentary in origin. The complexes of radiolarian, ratios of Al_2O_3/TiO_2 (average 27.2), and small Eu anomaly indicate a sedimentation of cherts in deep water environment.

We constructed the hypothetical paleogeographic reconstruction of studied cherts. By our petrographical, geochemical and stratigraphical data we can confirm deposited cherts in the ocean environment. Subduction processes in the investigated area during from Kimmerigian to Late Tithonian (Kemkin, Kemkina, 1998; Kemkin, 2003). The final formation of accretionary complex in Southern Sikhote-Alin took place in the Early Cretaceous (Kemkin, 2003).

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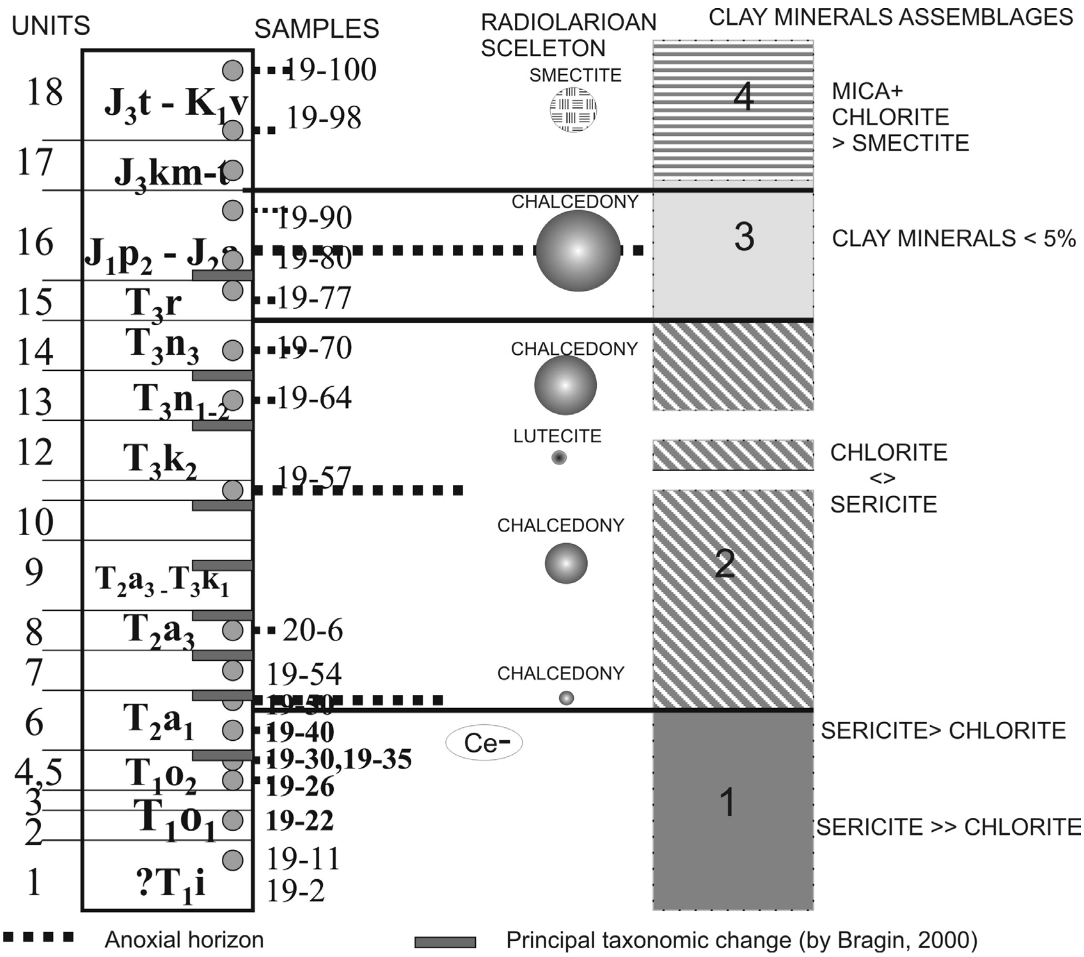

Fig. 1