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Evidences of the Late Paleozoic – Mesozoic subduction beneath the southern margin of the Siberian continent

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The Mongol-Okhotsk Ocean was an embayment of the Palaeo-Pacific, which existed in Late Paleozoic – Early Mesozoic between the Siberian continent and Amurian continental block. The scenario of the Mongol-Okhotsk Ocean development, characteristics of subduction of its crust beneath the Siberian continent and the age of subduction-related complexes are still under debate. We represent review of geological, geochronological and geochemical data on the Late Paleozoic – Mesozoic magmatic complexes of the Siberian continent, which are located north of the Mongol-Okhotsk suture. We assume that the formation of these complexes was related to the subduction of the oceanic crust of the Mongol-Okhotsk Ocean under the Siberian continent, which started in the Devonian, prior to the main peaks of magmatic activity. The magmatic complexes demonstrate variable compositions, which were possible controlled by a changing of the subduction regime. We noted that the Late Permian – Middle Triassic as well as Late Triassic calc-alkaline granitoid batholiths are located near the Mongol-Okhotsk suture, while alkaline granitoids and bimodal volcanic series occur on periphery of the batholiths. Similar spatial relationship of granitoids is typical for Andean-type active continental margin, which is generated above a subduction zone. This suggestion is confirmed by chemical compositions of Late Paleozoic – Early Mesozoic mafic rocks. All Late Carboniferous – Late Jurassic mafic rocks demonstrate the chemical features of the subduction-related basalts as well. They are depleted in Nb, Ta, Ti and enriched in Sr, Ba, Pb. However, the basaltoids, which are located further from the Mongol-Okhotsk suture are characterized by higher concentrations of K, La, Ce, Zr, Hf compared to rocks, which occur closer to this suture. These basaltoids show features of both island-arc basalts and within-plate basalts. Such chemical characteristics could be supplied by input of hot spot-enriched mantle to lithospheric mantle modified by subduction. The Carboniferous – Early Permian and Late Triassic alkaline granitoids of Transbaikalia correspond to A2-type geochemical affinities, which are typical to active margins also. Early Cretaceous basaltoids only demonstrate chemical features of typical within-plate basalts, reflecting final closure of the Mongol-Okhotsk Ocean. Thus, the synthesis of geological, geochronological and geochemical data on the Late Paleozoic – Mesozoic magmatic and volcanic complexes of the area studied allows us to trace how the subduction of the Mongol-Okhotsk oceanic crust beneath the Siberian continent controlled the igneous activity within southern Siberia, northern and central Mongolia since the Devonian till Early Cretaceous.