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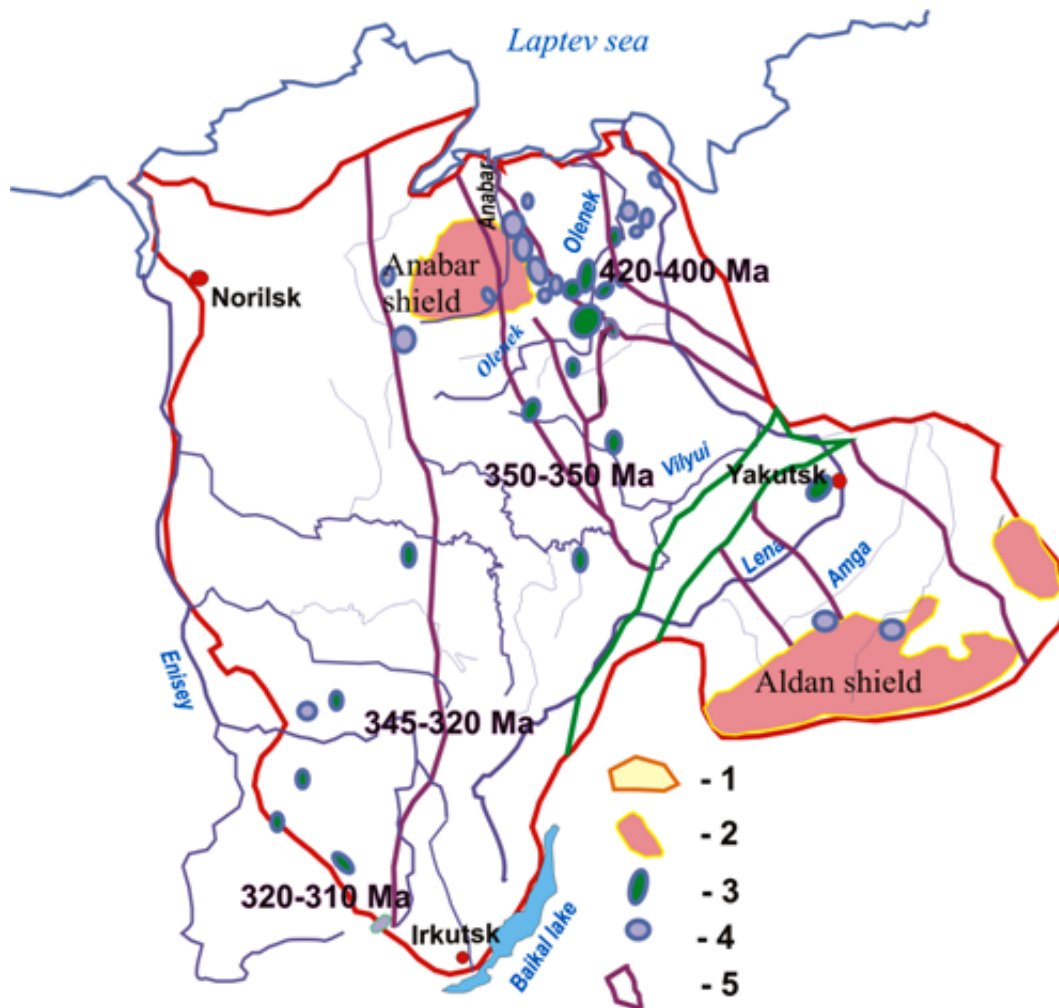


## The influence of the Siberian plume to the formation of Angaro-Vitim batholiths

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The influence of the hot spot for the AVB was assumed by (Kuzmin and Yarmolyuk, 2011). It may be the same hot spot that cause the creation of the kimberlites at 420 Ma at the north of Siberian craton (Sun et al., 2014; 2018) than in the central part of Yakutian kimberlite province 350- 370 Ma. and transferred to the Prisayanie forming kimberlite fields covered by Carboniferous Permian sedimentary sequences in the basins of Tumanshet, Biryusa and Chuna rivers. Then it produced the Ingashi kimberlites - lamproites 310 -300 Ma (Kostrovitsly et al., 2022).



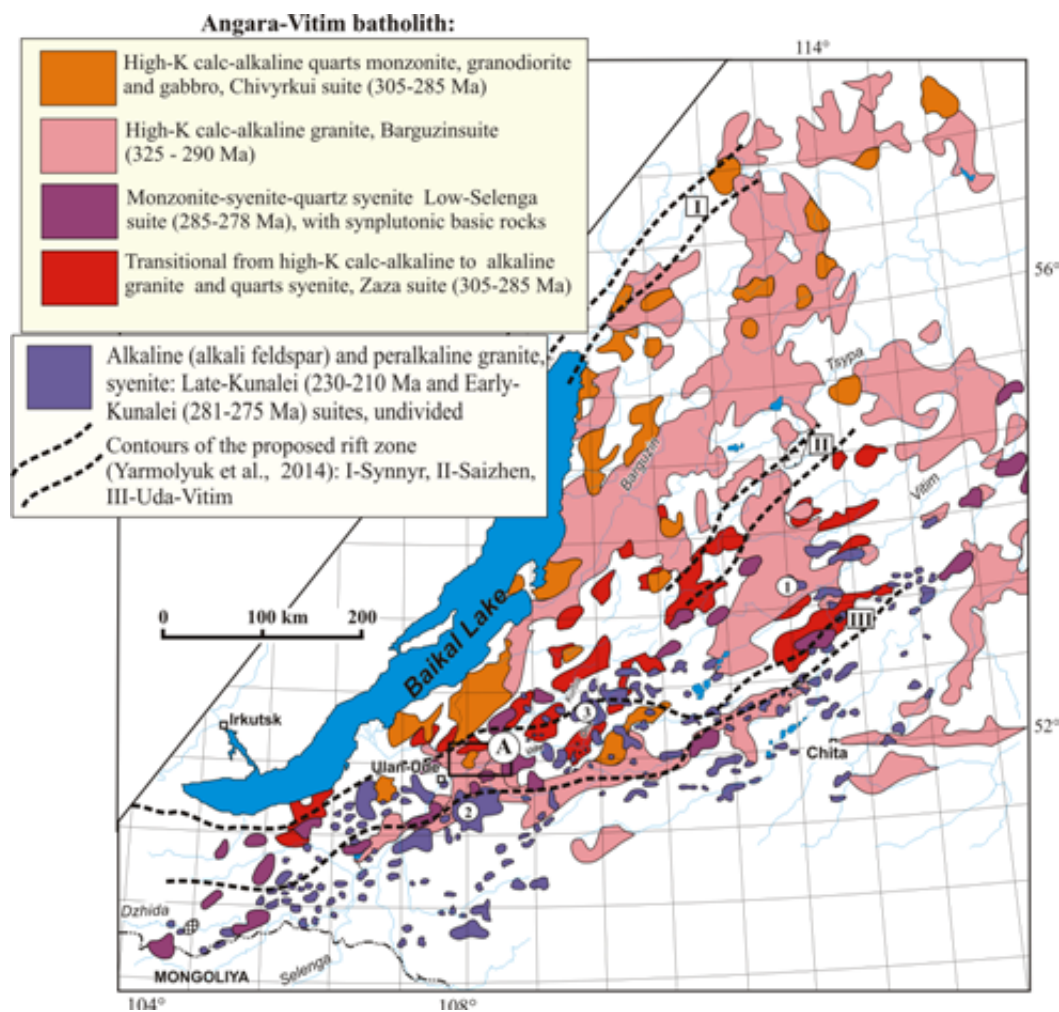
Granites of Angara-Vitim batholith were caused and influenced by this huge thermal event. The A-type granitoid magmatism and acid and mafic magmatism accompanied by mingling between these magmas suggest influence of the mantle plume (Litvinovsky et al., 2002; Tsygankov et al., 2019). This explains the K-nature of the granitoid magmatism, corresponding to the selective melting of the K-feldspars (Litvinovsky et al., 2000). This is the reason of the alkaline magmatism widely distributed among the AVB magmas (Tsygankov et al., 2010-2021).

The huge amount of the volatiles that accompany plumes are responsible for melting in the mantle and crust (White and McKenzie, 1995). But essential parts of plume volatiles are CO<sub>2</sub> and CH gases (Marty and Tolstikhin, 1998).. The H<sub>2</sub>O fluxes correspond to the starting and final stages of plume impulses (Ivanov et al., 2013). The periods of such pulses are nearly close to 30- Ma what is regulated by the Cosmic forces (Abbott, and Isley, 2002). Boundaries of the geological periods correspond to plume events In Transbaikalia, the H<sub>2</sub>O-rich flux was designated by transition to more acid magmas at 270 Ma. The CO<sub>2</sub>-rich flux at the maximum was manifested by the generation of the Burpala alkali-carbonatite massif (Vladykin et al., 2017).

Further, numerous already granitic and associated magmas and massifs were found in Eastern Sayan and Southern Pribaikalie. In Svyatoi Nos in Baikal 310 Ma (Kruk et al., 2023).

The simultaneously and later the hot spot created the main massifs of the AVB at the time span 275 -320 Ma (Khubanov et al., 2016; 2021). The further continuation could be found in Khangai

batholith (270-240 Ma) (Yarmolyuk et al., 2013).



Then at the eastern margin, the plume turned to the NNW again and created the Siberian large igneous province- Permo-Triassic traps (Kuzmin and Yarmolyuk, 2011) 260-240 Ma. the development of the plume magmatism in Early Triassic and later in Jurassic time probably was transformed to the Island hot spot (Kuzmin and Yarmolyuk, 2010).

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Kostrovitsky S.I. ea 2021. Special Publications 513, 45 - 70.

Khubanov V.B ea 2021. Russian Geology Geophysics. 62, 1331-1349.

Kuzmin, M.I. , Yarmolyuk, 2014. Russian Geology and Geophysics, 55, 120-143.

Kuzmin M.I. ea 2010. Earth-Science Reviews, 102, 29-59.

Yarmolyuk V.V ea 2013, Petrologiya , 21/2, 115-142.